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ILLINOIS NATURAL HISTORY SURVEY

DATABASE MANAGEMENT AND ANALYSIS OF FISHERIES IN ILLINOIS LAKES: OPTIMIZING FISHERIES MANAGEMENT

VOLUME 1

1 January 1993 - 29 February 1996

F-69-R- (7-9)
Final Report to
Division of Fisheries
Illinois Department of Natural Resources

Center for Aquatic Ecology

Pacifico J. Perea, Stephen T. Sobaski, Peter B. Bayley, Ralf Riedel, and David P. Philipp

July 1996

Aquatic Ecology Technical Report 96/5

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DATA BASE MANAGEMENT AND ANALYSIS OF FISHERIES IN ILLINOIS LAKES: OPTIMIZING FISHERIES MANAGEMENT (F-69-R)

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SUMMARY OF PROJECT

Database Management and Analysis of Fisheries in Illinois Lakes: Optimizing Fisheries Management (Project F-69-R (7-9)) is the continuation of projects F-69-R (1-6) and F-46-R with significant additions. The Final report is presented as two volumes

Volume 1 is composed of four major sections. Section 1, "Angler Surveys", presents a summary of the 13 creel surveys conducted during 1995, followed by a discussion of the results of several series of analyses conducted on the full creel database. Since 1987, 156 day and 16 night creel surveys have been conducted on 71 Illinois impoundments. Of these lakes, 11 have been creeled annually on a continuous or regular basis. Using these long-term data sets and the lake physio-chemical classification scheme developed during F-69-R (4-6), the relationship between fishing pressure and total fish harvest, long-term trends in fishing pressure, the correlation of bluegill creel size with that of largemouth bass, and how of these may relate to lake classification are investigated. The question of how to optimize the sampling design of creels is also addressed through the analysis of the effects of a simulated 15% reduction in sampling on the accuracy of standard creel estimates such as total fishing effort and total and species-specific harvests.

Section 2, "Fisheries Database Enhancements" discusses changes to the statewide lake fisheries database, FAS-LAKES, and new data entry and output programs written for the PC platform that replace the original Apple //e DOC9 system developed for field managers during F-46-R.

Section 3, "Historical database development and lake documentation" details enhancements to the statewide fisheries database that will facilitate the integration of lake management, fish stocking, creel regulation, and lake environmental history data with fish population survey data. Approaches to examining the influence of anthropogenic and environmental factors on the production of a largemouth bass, with the goal of evaluating the efficacy of various lake management practices, are also discussed.

Section 4, "Management Optimization", presents a model for evaluating cost-benefit outcomes in allocating management efforts and resources to achieve given levels of improvement (based on angler satisfaction) in the fishery of one or many lakes for one or many sportfish species. The evaluation component of this model is then applied to a specific example taken from the FAS-LAKES database, where long-term CPUE data for quality-sized largemouth bass, bluegill, and gizzard shad, taken from annual fall electrofishing samples on 27 state impoundments, are analyzed to predict the number of hours of electrofishing that would be required annually to detect a specific positive or negative change in CPUE over a range of years.

Volume 2, "A User's Manual to the FAS-LAKES Database and Software Package", expands upon the discussion of the new PC-based package for managing and analyzing fish population survey data presented in Section 2 of the first volume. A description of the revised design of the statewide lake fisheries database is given, followed by instructions for installing and using the FAS-LAKES data entry, tabular output, and graphical output programs.

This technical report is the final report of Project F-69-R (7-9), **Database Management and Analysis of Fisheries in Illinois Lakes: Optimizing Fisheries Management**, which was conducted under a memorandum of understanding originally between the Illinois Department of Conservation (later, as of July 1995, the Illinois Department of Natural Resources) and the Board of Trustees of the University of Illinois. The actual work was performed by the Illinois Natural History Survey, originally a division of the Illinois Department of Energy and Natural Resources, but as of July 1995, a division of the newly formed Illinois Department of Natural Resources. The project was supported through Federal Aid in Sport Fish Restoration (Dingell-Johnson) by the U.S. Fish and Wildlife Service, the Illinois Department of Natural Resources, and the Illinois Natural History Survey. The form, content, and data interpretation are the responsibility of the University of Illinois and the Illinois Natural History Survey, and not that of the Illinois Department of Natural Resources.

Table of Contents

Acknowledgements

We wish to thank the following people:

Roy Mahnesmith and Betty Carroll for overseeing the day to day operations of the creel project; past creel supervisors, especially Dave Miko, Doug Staske, Mike Halter, and Joe Stepping; Jim Machung and Jana Lucht for their fine work in supervising creel data entry, reporting, and data management; the more than one hundred Creel Clerks, past and present, who have collected data under all conceivable weather conditions and who continually promoted the value of the creel program and work of the IDNR to the fishing public; our creel data entry clerks, especially Cheryl Hoochung and Holly Hollis; Bob Illyes for his yeomen work in creating the new PC software package for FAS-LAKES and his valuable suggestions for improving the FAS-LAKES database; Darren Benjamin for his assistance in producing lake morphometry maps as well as with creel and database management work; Chuck Douglas for programming the initial version of FISHTAB; IDNR District and Regional Managers and especially Doug Austen, Gregg Tichacek, Scott Stuewe, and Jim Mick for their cooperation, assistance, and valuable input with all aspects of this project; Kathy Darr and Deanne Krumwiede for their tireless efforts in managing the endless paperwork and record keeping associated with this project; and last, but not least, the thousands of anglers who willingly shared their fishing experiences with us during our creel surveys.

Executive Summary

Since its inception in 1987 the INHS creel survey program has continued to develop and meet the needs of fishery managers as well as answer the questions sought by fisheries researchers. In segments 7, 8, and 9 the project has developed predictive models of boat and shore angler counts based on vehicle counts and utilized them on access point creels, worked with other public agencies to provide creel information for fisheries managers working for the USFWS and Will County Forest Preserve District, and utilized the FAS Creel software to analyze walleye data collected from a stream creel on the Mississippi River at Lock and Dam 17 during 1991-1992, as well as ice creel data collected by USFW and IDNR from the Keithsburg Refuge backwater area of the Mississippi River in 1994. The creel database continues to grow, especially with the addition of continuous creel data from two classes of Illinois lakes previously absent from the core set of long-term study lakes. Data from a number of these surveys have provided important short-term information to managers evaluating the stocking success of coolwater species of sportfish such as walleye, muskellunge, and striped bass, while also giving managers insights to long-term trends in the lake fisheries throughout the state. Analyses of these data have revealed the importance of repeated creels in tracking developments on a lake's fishery, the relationship of fish production with the physico-chemical classification of a lake, the relationship of largemouth bass and bluegill size with lake classification, and the results of sampling reduction on estimating long-term trends in a lake's fishery.

Typical creel surveys conducted during F-69-R utilize a sampling ratio (percent of all possible day-periods sampled) of 40% or more. In seeking ways to more efficiently design creel surveys, the data for Weldon Springs Lake were reanalyzed with a simulated 15% reduction in effort. This was accomplished by taking existing annual creel data sets and eliminating approximately one out of every six day-period sampled. This effective 15% effort reduction, resulting in a sample effort of 33.9-34.7%, did not significantly affect estimates of total effort or harvest. Similarly, individual species estimates of harvest and catch rates for major sport species (largemouth bass, bluegill and channel catfish) were not significantly altered by this reduction in sampling frequency. However, estimates for more seasonally caught species, such as crappie, did show some decrease in accuracy.Results suggest that, for lakes similar to Weldon Springs, this reduced sample schedule is appropriate. A similar re-analysis of other long-term creel data sets from lakes of various sizes and fisheries types should be made to ascertain appropriate levels of sampling effort for all lake creels.

Software development (Job 2) included the completion of the transfer of the Fisheries Analysis System software (FISHTAB) to the Windows-Intel-based Paradox database system. All General Manager software developed for the Apple //e-based earlier version of the FAS software was converted to Paradox PAL language for the data entry and C for the output programs. Data entered into the GM system and currently stored in Apple //e format is currently being converted to the Paradox system. The Paradox-based FishTab software includes data entry, tabular and graphical output. Data entry mimics the field data recording sheets and has proven to be very efficient. Tabular outputs include length-frequency and condition index tables, stock index tables that include proportional stock density (PSD), relative stock density (RSD), and young-to-adult ratios (YAR), and catch-per-unit-effort (CPUE) tables that show catch in numbers and biomass per unit of sampling effort. Graphical output includes length-weight scatter plots, length-frequency histograms, relative weight by length plots, and mean length at age tables.

Management history and historical fish population survey data (Job 3) on 184 state-managed lakes were collected from IDNR-Fisheries District offices statewide during 1993-1994. The selection of lakes was based on the consistency of fish population sampling procedures over the years and the frequency of sampling. To incorporate these data into the statewide FAS-LAKES database, Paradox tables were developed for lake management history information, state fishing regulations, and fish stocking records. The entry of historical lake management and fisheries data and fish stocking records in FAS-LAKES was completed during 1994-1995, while the entry of fishing regulations began in 1995 and is on-going. Morphometric and limnological data were also collected on 12 state-managed lakes during 1994. The morphometric data were interpreted and digitized, and GIS covers were prepared for each lake. Proposed preliminary analyses are described for evaluating fisheries management activities in Illinois lakes.

Management optimization (Job 4) was addressed at two levels. At the global level a conceptual management investment model was developed that includes allocation of investment among lakes and species according to angler interest, as measured from directed effort from creel surveys, and 'room for desired improvement' in each fishery, estimated in part from angler satisfaction ratings. A numerical simulation demonstrated the process between two lakes containing three species groups. The allocated investment must then be apportioned among

management components, including evaluation. This requires the costing of the risks associated with wrong decisions as well as the expected costs and benefits. The evaluation component was addressed in a specific example at the second level, in which sampling investment in fall electrofishing was estimated for three species from FAS data, using time series of 4-10 years from 27 lakes. Sampling investment was estimated given risks associated with misinterpretation (Type 1 and 2 errors) and a given trend in catch per unit effort (CPUE). Sampling investment could be predicted across lakes as a function of length of time series and mean CPUE. Lake size was not a significant factor. The model and analysis provide a point of departure for collecting and analyzing economic information in combination with existing FAS data so that management efficiency and effectiveness can be improved in the future.

Job 101.1. Angler Surveys

Project Objective: Conduct creel surveys on selected lakes in conjunction with the ongoing F-29-D program. Special emphasis will be placed on the selection of lakes that are representative of larger sets of lakes, provide long-term data series, and from which good fish population data are taken from regular samples.

Segment 9 Objectives: Conduct creel surveys on selected core lakes and lakes with both management and research interests. Compile and analyze creel data for annual reports. Update creel results in the FAS database.

Activities related to the aforementioned objectives are met in the following sections and results specific to segment 9 objectives are found in Appendix A.

1.1 Summary of 1995 Activities

During 1995 13 creels were scheduled and conducted. The 13 day creels included three of the core group of 11 long-term creel research lakes: Beaver Dam Lake, Jones State Lake, and Red Hills State Lake. The remaining 11 surveys included Argyle Lake, Clinton Lake, Clinton Tailwater, Kinkaid Lake, Monee Reservoir, Newton Lake, Otter Lake, Powerton Lake, Randolph County Lake, and Skokie Lagoons. All lakes were surveyed over the standard eight month period (mid-March through mid-November) with exceptions of Clinton Lake (section 1 closed due to safety concerns during waterfowl season in mid-October and section 4 closed to boat fishing October 10 through March 31 as a Fish and Waterfowl Refuge), Powerton (started mid February and closed in mid-October for waterfowl hunting), Otter Lake (one section closed in mid-October for waterfowl hunting), Skokie Lagoons (opened for fishing July 1and ended Oct 31), and Monee Reservoir (started on April 1 ended October 31).

As in all recent years, the improved precision values of angler effort, harvest, and catch observed in 1989 and 1990 were maintained (Appendix A). The overall sampling effort consisted of at approximately 40% of all possible work shifts over the length of the creel. The 95% confidence range for the estimated total hours fishing ranged between 5-11% of the total effort value. The 95% confidence range around the estimated total weight of fish harvested generally fell within 13-26% of the estimate, except for the abbreviated creel at Skokie

Lagoons, where the 95% confidence range was 57% of the estimate.

Several noteworthy aspects of the 1995 creels include two access-point creels, an abbreviated creel on a recently rehabilitated lake that was closed to fishing for two years, continuance of a creel at Monee Reservoir in cooperation with the Will County Forest Preserve District, and an ice creel on a Mississippi River slough supported by the U.S. Fish and Wildlife Service and Illinois Department of Natural Resources with technical support of the Illinois Natural History Survey.

An access-point creel design was implemented at Powerton Lake and Newton Lake due to the limited fishing access at these lakes. At each lake, boat access was restricted to a single ramp, while shore fishing was negligible and/or concentrated around the ramp. Vehicle counts were used to calculate the number of boat and shore anglers at both lakes. Vehicles with trailers (to estimate boat anglers) and without trailers (to estimate shore anglers numbers) were counted at the parking lot at times assigned to roving instantaneous counts. Angler and vehicle count data from a 1990 creel survey on Powerton as well as data collected during the 1995 creel season at Powerton were re-analyzed to improve the predictive value of the number of vehicle to angler extrapolations. The resulting relationships were subsequently used in the final analysis of 1995 Powerton and Newton Lake creel data.

Skokie Lagoons were creeled as a four section lake and opened on July 1, 1995 after two years of closed fishing and a major rehabilitation of the fishery. The site proved to be difficult to fully access, and the combination of convoluted sections, lowhead dams, and dikes meant a fairly complex creel design with a roving clerk using a combination of methods (canoeing, bicycling, walking, and driving) to reach the anglers. The precision of the effort estimate was fair, with a 95% confidence interval of 13%, but the precision of harvest estimates suffered from the small sample size due to the short period of creel (July-October) and extreme variability among sections. This creel was another excellent example of cooperation between several different agencies to obtain a mutual goal. Without the cooperation from the Chicago Park District, IDNR, Chicago Police Department, and INHS, this project would not have been completed.

The creel on Monee Reservoir was continued in 1995 with the same cooperation from the Will Co. Forest Preserve District. The creel design, management, and data analysis were provided by INHS creel project personnel, while the hiring of clerks and salary cost, generally the

greatest expense in conducting a survey, were provided by the Forest Preserve District.

Finally, an ice creel was conducted by the INHS in cooperation with the U.S. Fish and Wildlife Service and Illinois Department of Conservation at the Keithsburg Refuge. The USFWS and the IDOC provided the funding and clerks while the INHS provided the creel design, technical consulting, and data analysis.

1.2. Analysis of Long-term Creel Data

Since 1987, a total of 156 day and 16 night fishing surveys have been conducted on 71 state-managed impoundments (Figure 1.1). The 71 lakes creeled included the core group (Figure 1.2) of 11 long-term creel research lakes: Beaver Dam, Coffeen, Dolan, Jones, Carlton, George, Pittsfield, Ramsey, Red Hills, Washington Co., and Weldon Springs. All lakes were surveyed over the standard eight month period (mid-March through mid-November) with exceptions of Lake Carlton (creeled for ice fishing beginning in January) and Coffeen (creeled year-round).

The core study lakes were repeatedly creeled to address several fisheries management questions. Here, we investigate the relationship of fishing effort to fish harvest, the correlation of fishing harvest and effort with lake classification, the interactions between major gamefish species, and the effects of sampling reduction on the precision of creel results. Lakes ranging in size from some of the smallest state impoundments to the three large U.S. Army Corps of Engineers reservoirs have been sampled to provide the baseline of the long-term fisheries database.

This report relies on graphical analysis to examine most of these questions. For the majority of analyses, data from creeled lakes were grouped using the Illinois lake classification scheme proposed by Austen and Bayley (1993). The final section presents results from a series of simulated reductions in creel sampling at Weldon Springs from 1990 to 1994 and discusses their effect on the value, precision, and trend of effort and harvest estimates.

1.2.1 Effects of Harvest

One of the major concerns of fishery biologists and managers is the problem of fishery overexploitation, where overexploitation is defined as a decrease in total yield when fishing effort increases. Examination of the "core lakes" data suggests that this is not a problem

common to Illinois reservoirs, if we consider yield of all species combined. Increases in fishing effort did not appear to negatively impact the total harvest of fish (lbs/acre) in any of the nine impoundments examined. Long-term creel data from small (Class F), medium (Class B), and large (Class G) lakes (Figures 1.3-1.5) repeatedly showed a strong relationship between angling effort and total harvest on a per lake acre basis, but failed to reveal any major decreases in total fish harvest/acre with increases in fishing pressure. Overall, small lakes provided the highest levels of total fish harvest per surface acre, while concurrently withstanding some of the highest angling pressure per acre. By contrast, larger lakes saw considerably less fishing pressure and total harvest per acre (Figure 1.6). This is expected because of the lower productivity of deeper areas in larger lakes.

1.2.2 Long-term Trends

Another management concern is the long-term variability of fishing pressure on lakes (Figure 1.7) and, in general, the degree of creel sampling necessary to assess or detect significant changes in a lake's fishery. Our data suggest that, in order to reliably assess fishing pressure and its impact at a particular lake, evaluations must be based on several creel surveys. Isolated surveys will provide reliable information on fishing pressure and exploitation for that given year, however they provide practically no long-term predictive value. To detect trends in fishing pressure, creel assessments need to be repeated within a reasonably consistent time frame (every 1 to 3 years). This is necessary because lakes often undergo cyclic or irregular fluctuations in fishing pressure rather than steady increases or decreases (Figures 1.3-1.5). Interestingly, sets of lakes within each lake classification showed a similar trend in fishing pressure and harvest per acre of lake over time.

1.2.3 Bluegill and Largemouth Bass Size Comparisons

A common concern of fisheries managers is maximizing the quality of game species to meet the demands of a diverse angling public. To investigate this issue, the relationship between harvest size of two principal Illinois impoundment sportfish, largemouth bass and bluegill was examined. Both are commonly found throughout the state and are popular targets of anglers and focal points for management efforts. Small (Class F) and medium (Class B) lakes showed a generally strong positive relationship between the average harvest sizes of largemouth bass and bluegill. Large (Class G) lakes, however, displayed only a weak relationship at best between the average harvest size of both species (Figures 1.8-1.10). In small and medium lakes the higher ratio of littoral to pelagic zone may increase the interactions between largemouth

bass and bluegill sufficiently to make largemouth bass the primary predators of bluegill. In sufficient densities, such predation can significantly influence the population structure of bluegill. In larger impoundments the lower ratio of littoral to pelagic zone may decrease the interactions between largemouth bass and bluegill to the point where bluegill are not heavily preyed upon by bass. Other forage species, such as gizzard shad, may be available to bass, thus potentially diminishing their direct influence on the structure of the bluegill population. In such cases other factors may principally shape the size distribution of bluegill.

1.2.4 Weldon Spring Re-analysis

Finally, to test the cost effectiveness of the current target sampling ratio of 40%, five years of Weldon Springs (Class F) data were re-analyzed using random sub-sampling of the existing data sets to produce a 15 % reduction in the number of dates sampled. The reduction was used to test how much sampling is necessary to detect a trend and at what point reduced sampling significantly decrease the accuracy of the data. Sample dates from each creel were randomly eliminated without replacement for seven scenarios: six 15 % reductions labeled AAA, BBB, CCC, DDD, EEE, and FFF and the remaining 10% reduction category of GGG. Six analyses per year were performed by simply excluding each of the six 15% categories in turn. Our earlier creels had suggested that sampling above the overall ratio of 40% of all possible work shifts was necessary to obtain reliable estimates of harvest and effort. Weldon Springs has been traditionally sampled at an overall rate of 40% to 48% (Table 1.1), so the re-sampling with the 15% reduction should reduce the sampling ratio to below the 40% threshold. Total effort and total harvest estimates apparently are not significantly affected by this level of sampling reduction (Figure 1.11-1.12) with one exception, the 1990 run of "harvest" FFF (Figure 1.12). While deviating from the trend, the FFF run is not significantly different when comparing the 95% confidence intervals of the FFF run with the original Weldon Springs results. Otherwise, the trend within re-sampled runs show fairly consistent results. When comparing the accuracy of the re-sampled runs to the original results, however, the 1991 re-sampled data (Figures 1.11-1.12) shows a consistent overestimate of both total effort and total harvest. This is primarily due to the coalescing of data from two year periods that was necessitated by the undersampling of one of those periods. Less sampling occurred in 1991 due to an early closure of the lake. This produced a sampling ratio of 41% with a re-sampled ratio of 33.9 -34.7%. Dropping sampling this far below the 40% threshold appears to have some effect on the precision of the estimate, but does not affect the visible trends for total effort and total harvest.

Next, major gamefish species were examined to see if the reduced sampling would affect the long-term trends and the accuracy of the species harvest estimates. Largemouth bass, bluegill, channel catfish, and black crappie total harvest showed fairly consistent trends within re-sampled runs with (Figures 1.13-1.16). Trends in two re-sampled runs (DDD and EEE) of redear sunfish data, however differed from that observed in the original data (Figure 1.17). Of all the major game species examined, redear sunfish were least abundant in the sampling, so a reduction in sampling may significantly alter harvest estimates by excluding dates when large numbers of redear were harvested. When trends were compared to the original data, the problems associated with the 1991 data due to coalescing appeared to only affect the channel catfish and redear sunfish data. Otherwise the trends of harvest for largemouth bass, black crappie, and bluegill were not significantly altered. The precision of the estimated harvest data from the reduced sampling were not significantly different from the original data for largemouth bass, bluegill, channel catfish, and redear sunfish. (Figures 1.11-1.15 and 1.17.) Black crappie harvest however, was significantly different in three years of resampling (Figure 1.16) when compared to the original data. Sampling reduction does have an impact on the accuracy of black crappie harvest estimates. This may be due to the numbers that are harvested on a seasonal basis, where large numbers are often taken during a short time period in the spring and reduced sampling influences the estimate by excluding days when many are harvested.

In summary, sampling below a 38-40% threshold appears to affect the precision of estimates and in some cases affects the trends in Weldon Springs Lake. A 15% reduction in sampling dates that produces a sampling ratio at 38-40% does not appear to affect trends or precision of estimates with the exception of highly seasonal species such as crappie or less commonly harvested fish such as redear sunfish. Analysis of other lakes in this classification should be done in order to assess if the effects of the 15% reduction are consistent within classification before applying them to all Class F lakes. Other lake classifications should also be re-examined to determine if a 15% reduction in sampling would be both economically feasible and reasonably precise for fisheries management utilization. A problem with reduced sampling is that the ability of the creel to examine stock assessments on seasonal or rarely caught fish may be greatly diminished or unreliable. Increased sampling (up to 50%) or alternative methods (creel cards, mark and recapture, or electrofishing) may be necessary to examine such stock assessments.

References

Austen, D.J. and P.B. Bayley. Environmental classification of Illinois lakes and relationships with fish communities. Final Report toDivision of Fisheries. Illinois Department of Conservation Federal Aid Project F-69-R (4-6). June 1993.

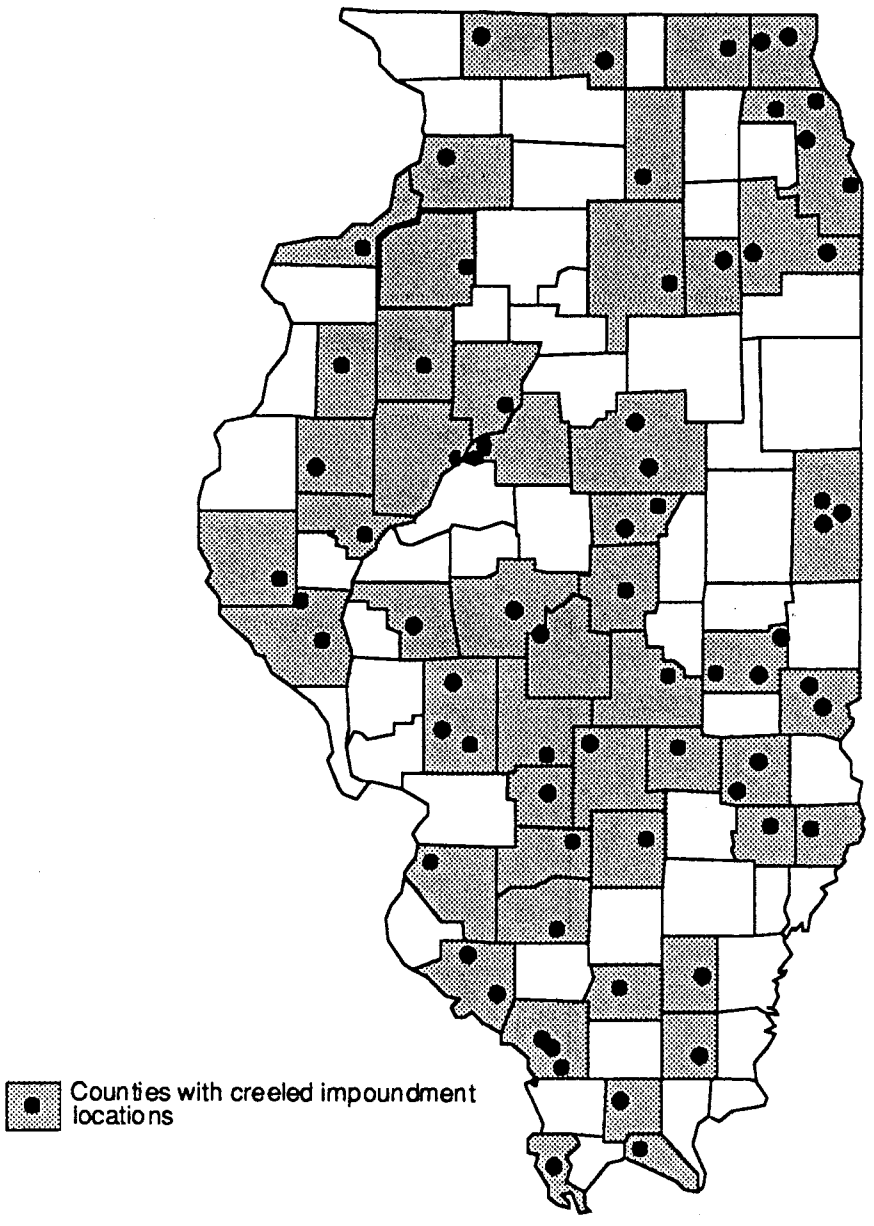

Figure 1.1. Locations of all lakes creeled between 1987 and 1995.

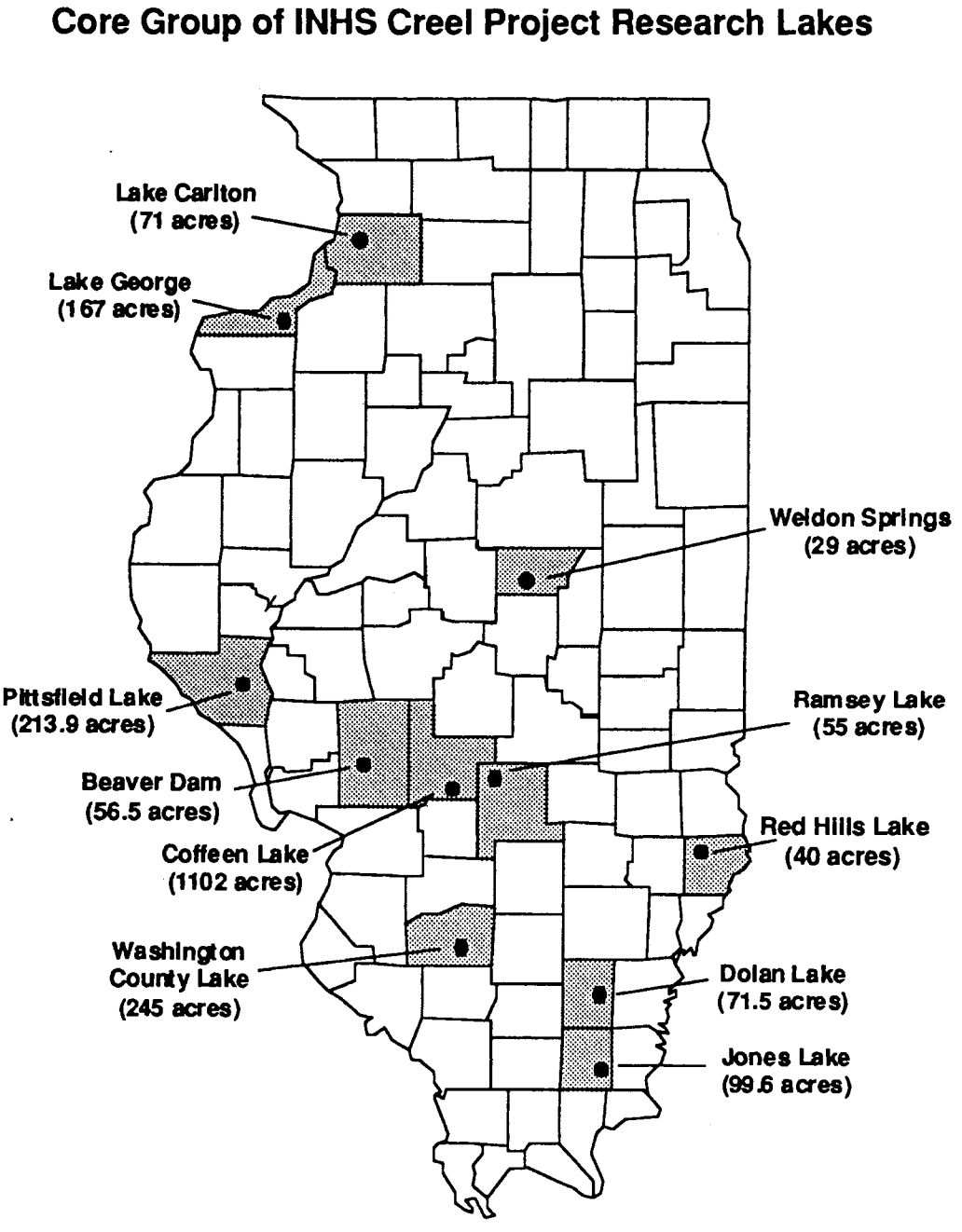

Figure 1.2. Map of 11 core INHS Creel Lakes and county locations.

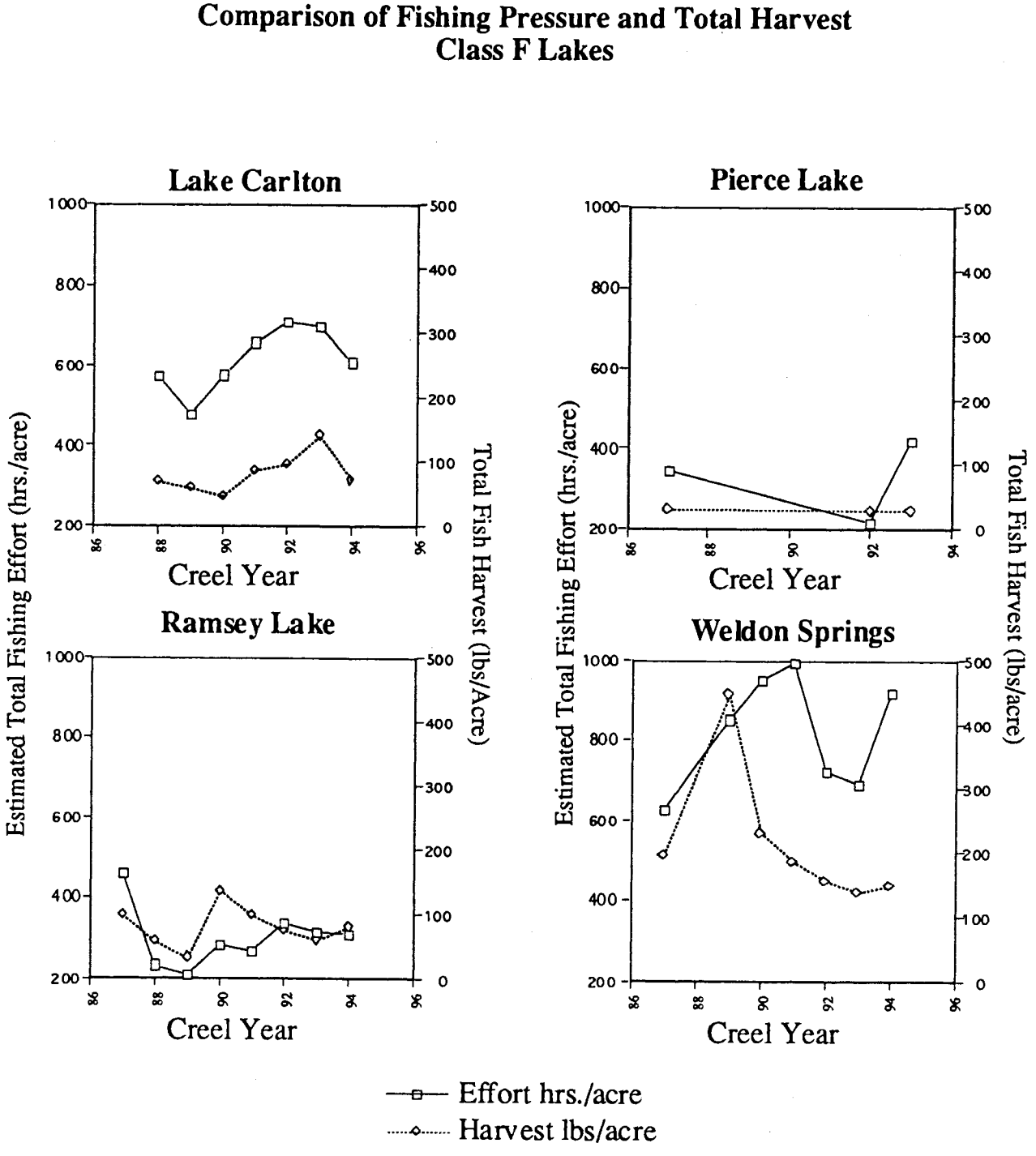

Figure 1.3. Comparison of long-term trends in estimated total annual fish harvest by anglers (lbs/acre) with total fishing effort (boat and shore combined) for four small (Class F) Illinois impoundments.

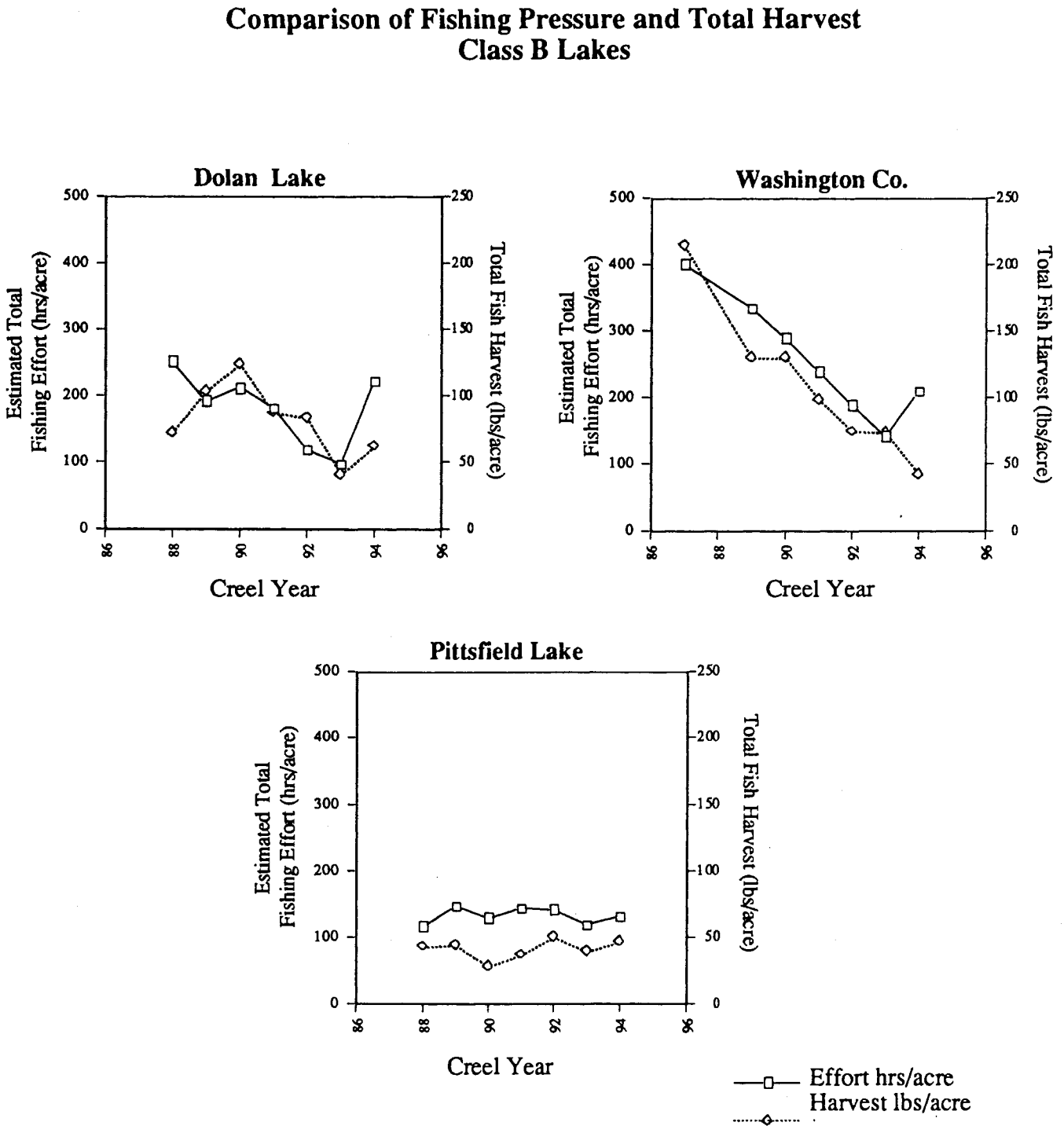

Figure 1.4. Comparison of long-term trends in estimated total annual fish harvest by anglers (lbs/acre) with total fishing effort (boat and shore combined) for three medium (Class B) Illinois impoundments.

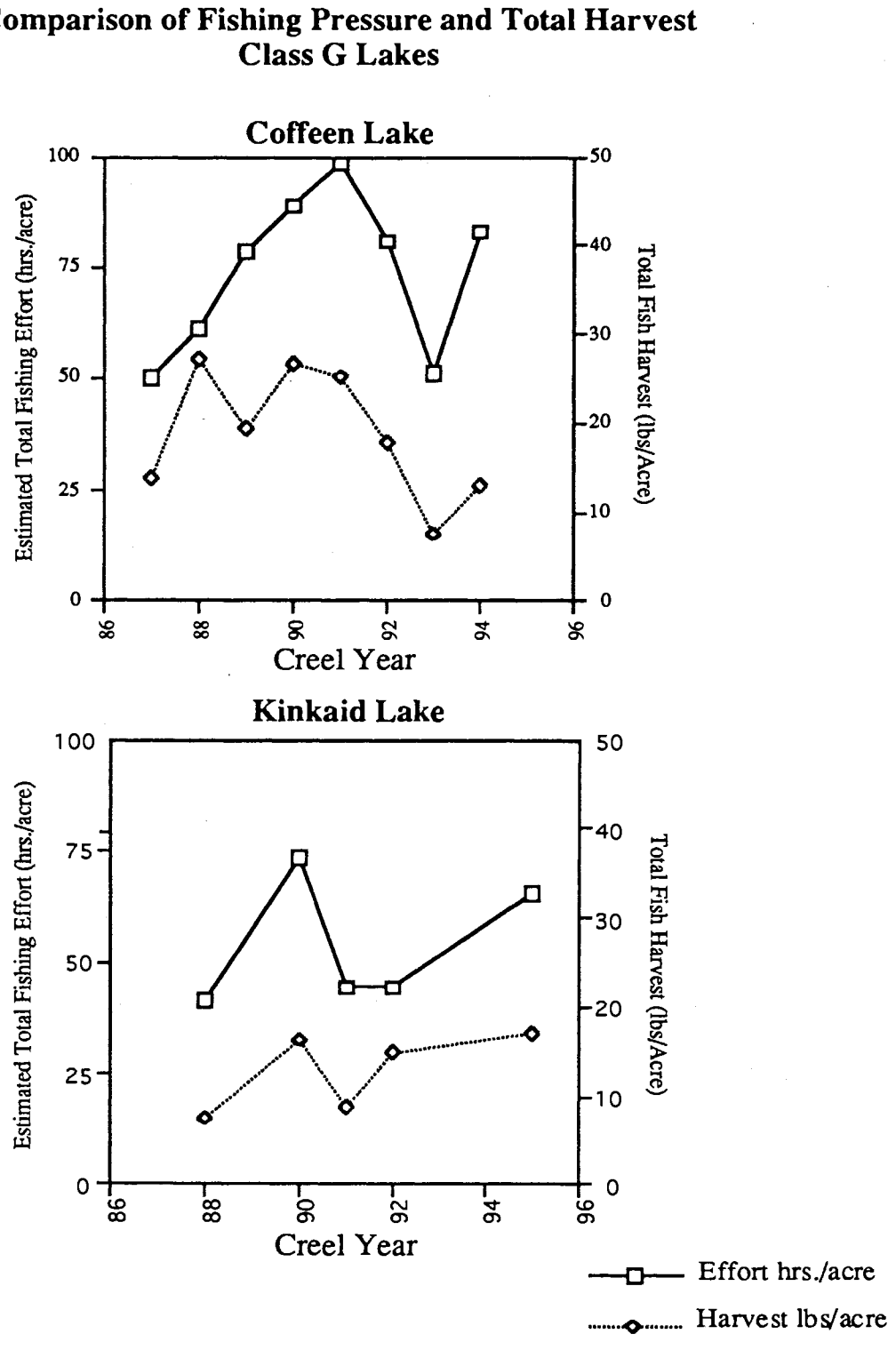

Figure 1.5. Comparison of long-term trends in estimated total annual fish harvest by anglers (lbs/acre) with total fishing effort (boat and shore combined) for two large (Class G) Illinois impoundments.

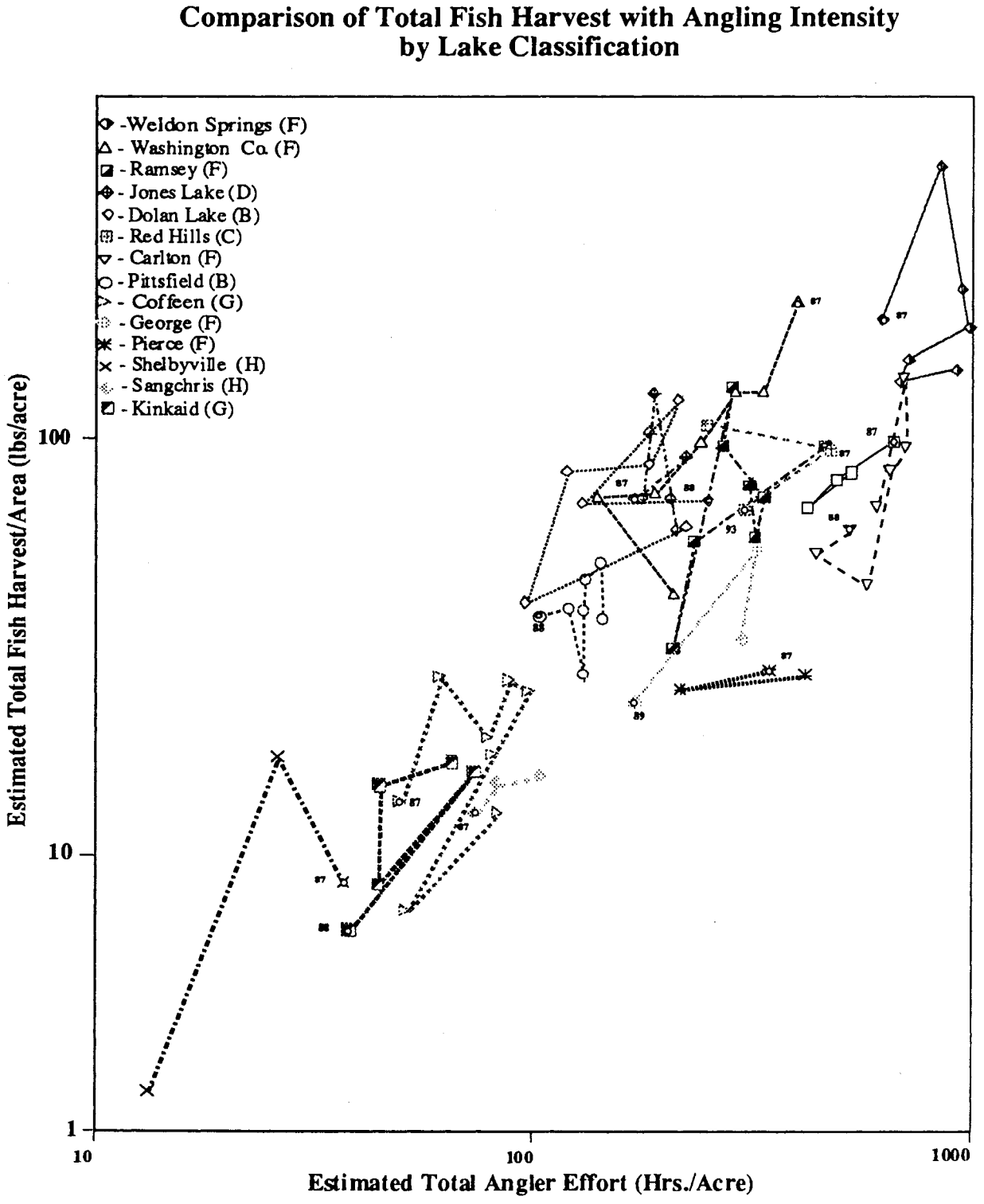

Figure 1.6. Time series comparisons of total harvest (all species) per lake area versus total angler intensity (boat and shore combined) for fourteen impoundments creeled for three or more years since 1987. Values are displayed on a log scale. Lines join annual creel estimates in chronological order, with the first creel indicated by year and denoted by an inverse period. Lake classification is given in parentheses following the lake name.

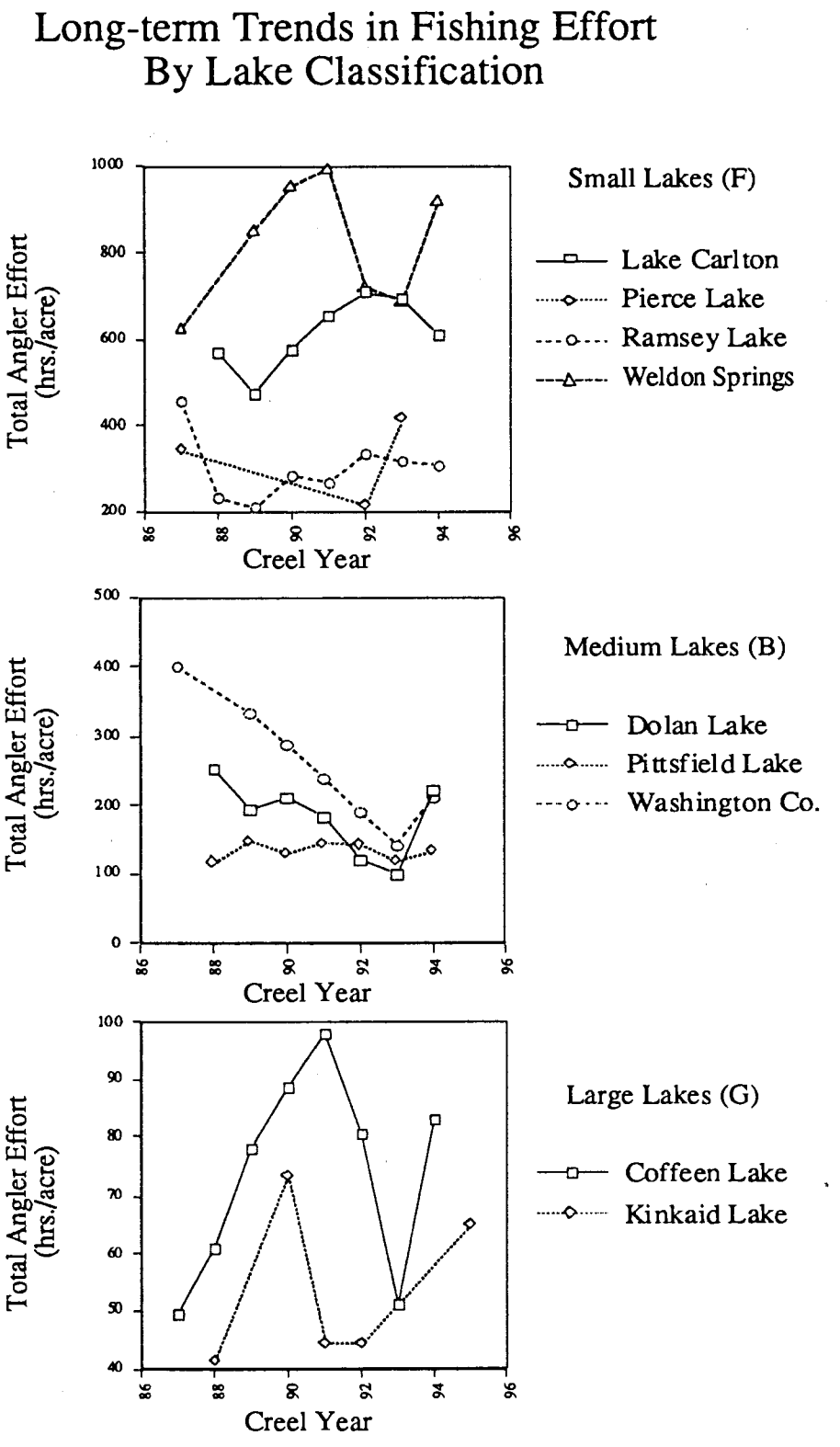

Figure 1.7. Trends in total annual fishing effort (hrs/acre) for small (F), medium (B) and large-sized (G) Illinois impoundments.

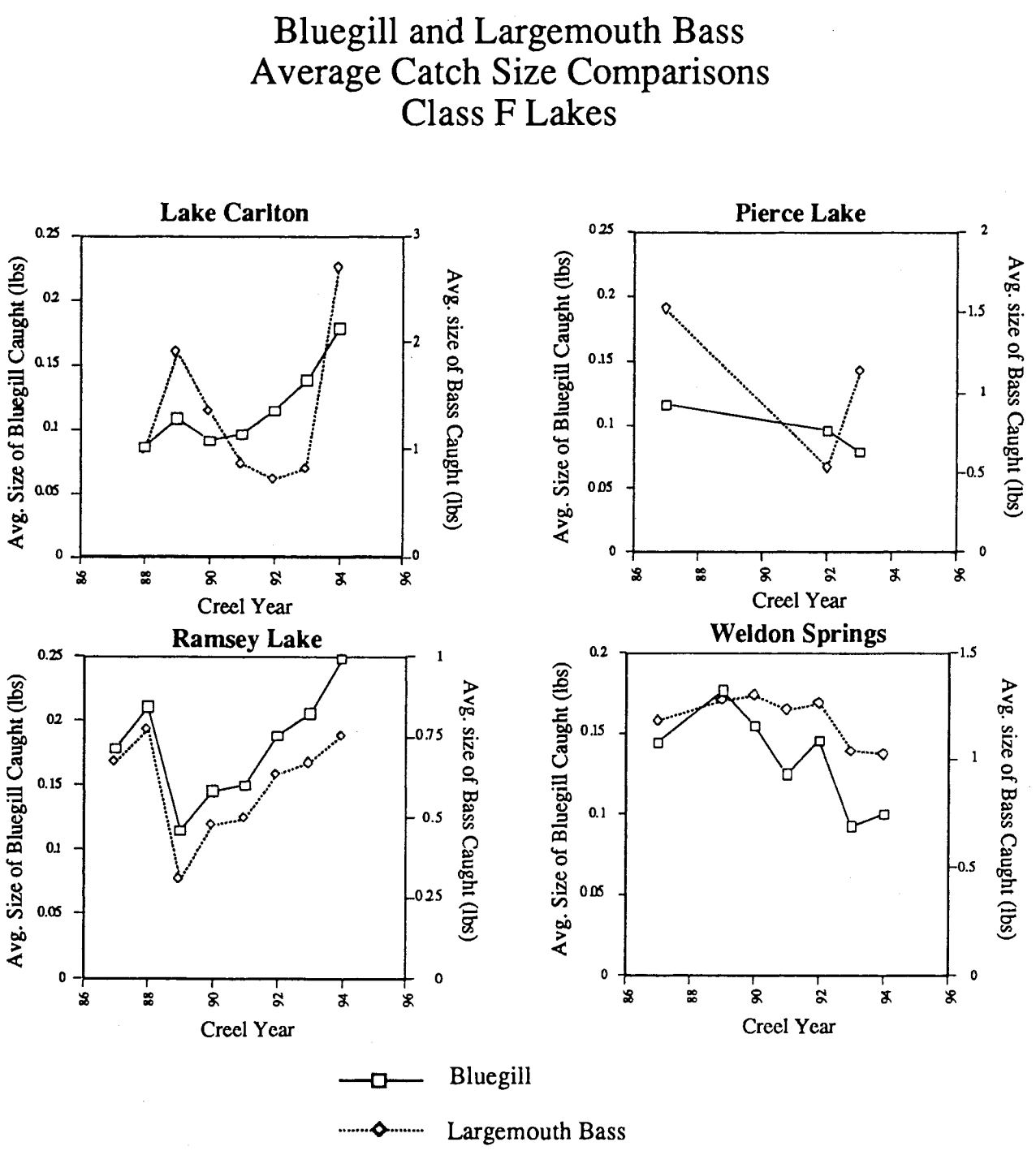

Figure 1.8. Comparison of long-term trends in the average size (lbs.) of bluegill and largemouth bass caught in three small (Class F) Illinois impoundments. Average weight calculations include all fish (harvested and released) reported by anglers and are based on the conversion of total length using length to weight relationships developed for each species.

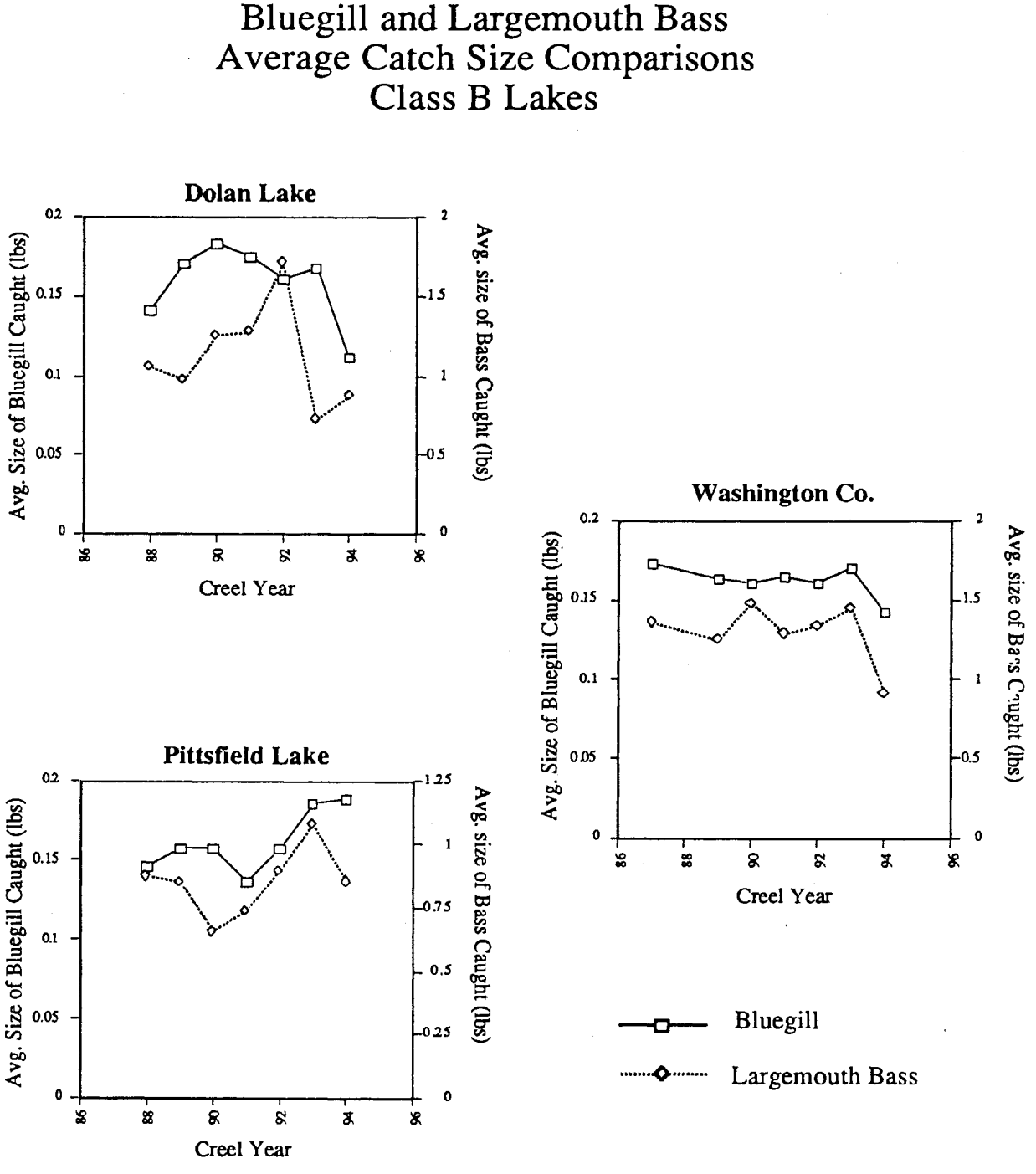

Figure 1.9. Comparison of long-term trends in the average size (lbs.) of bluegill and largemouth bass caught in three medium (Class B) Illinois impoundments. Average weight calculations include all fish (harvested and released) reported by anglers and are based on the conversion of total length using length to weight relationships developed for each species.

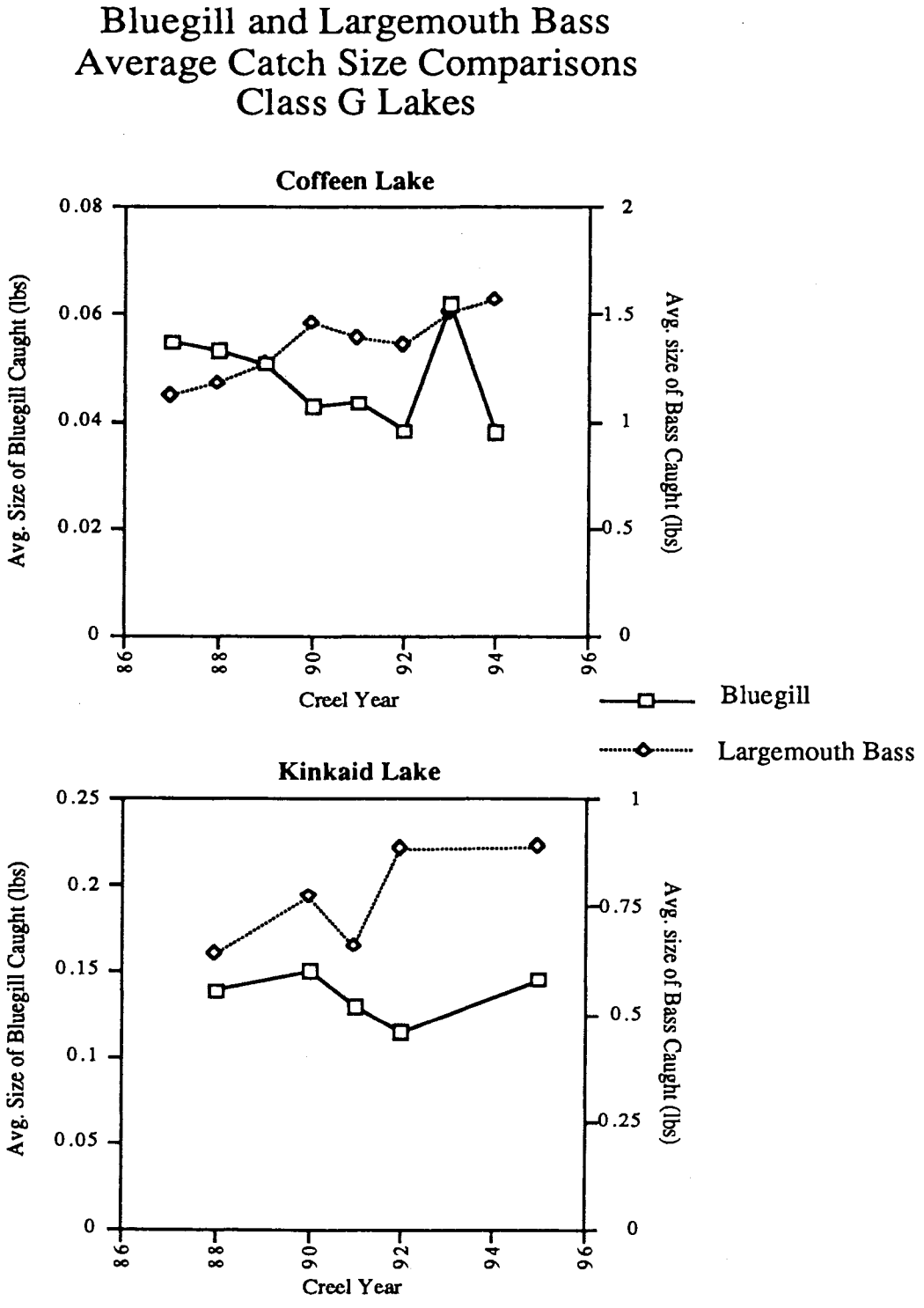

Figure 1.10. Comparison of long-term trends in the average size (lbs.) of bluegill and largemouth bass caught in two large (Class G) Illinois impoundments. Average weight calculations include all fish (harvested and released) reported by anglers and are based on the conversion of total length using length to weight relationships developed for each species.

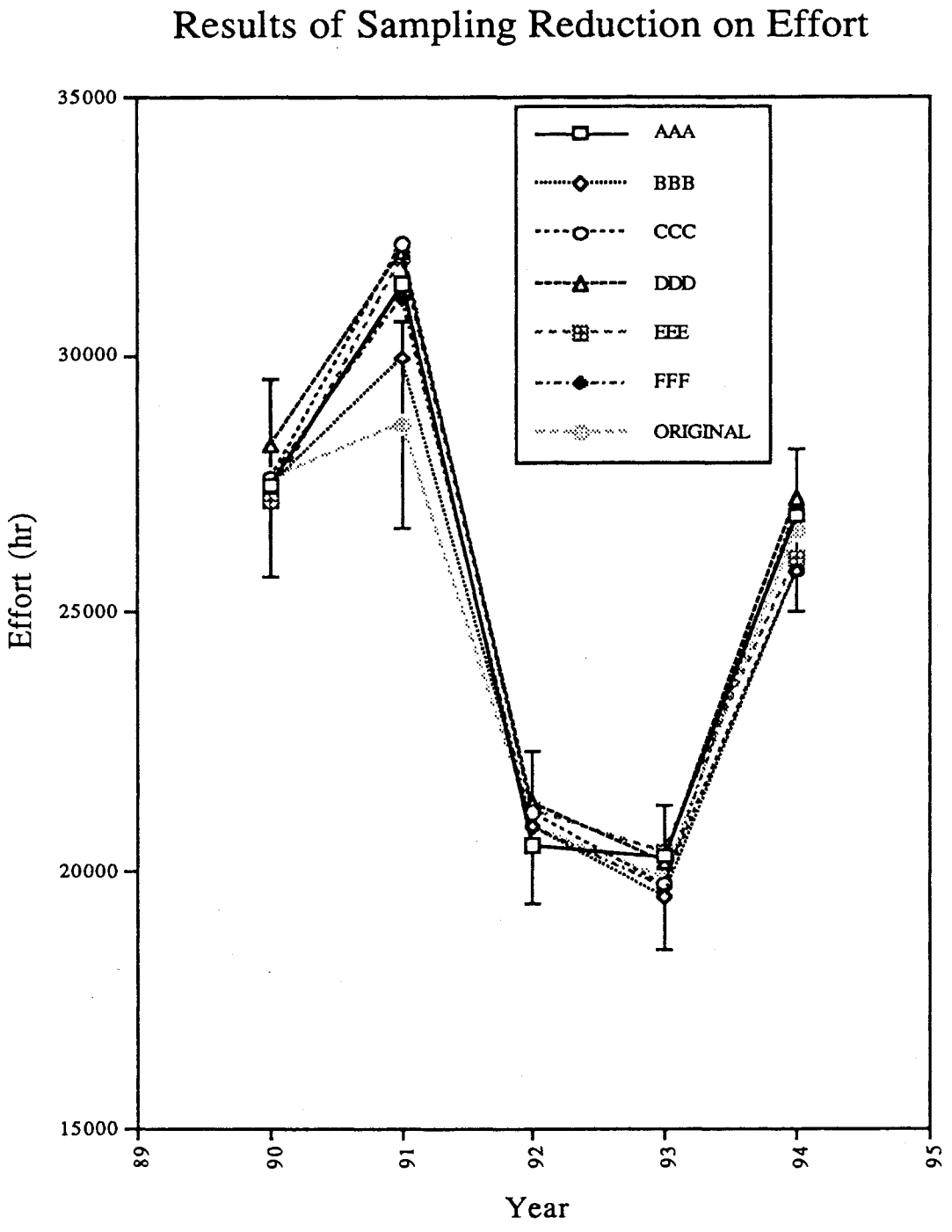

Figure 1.11. Six runs of re-analyzed effort data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

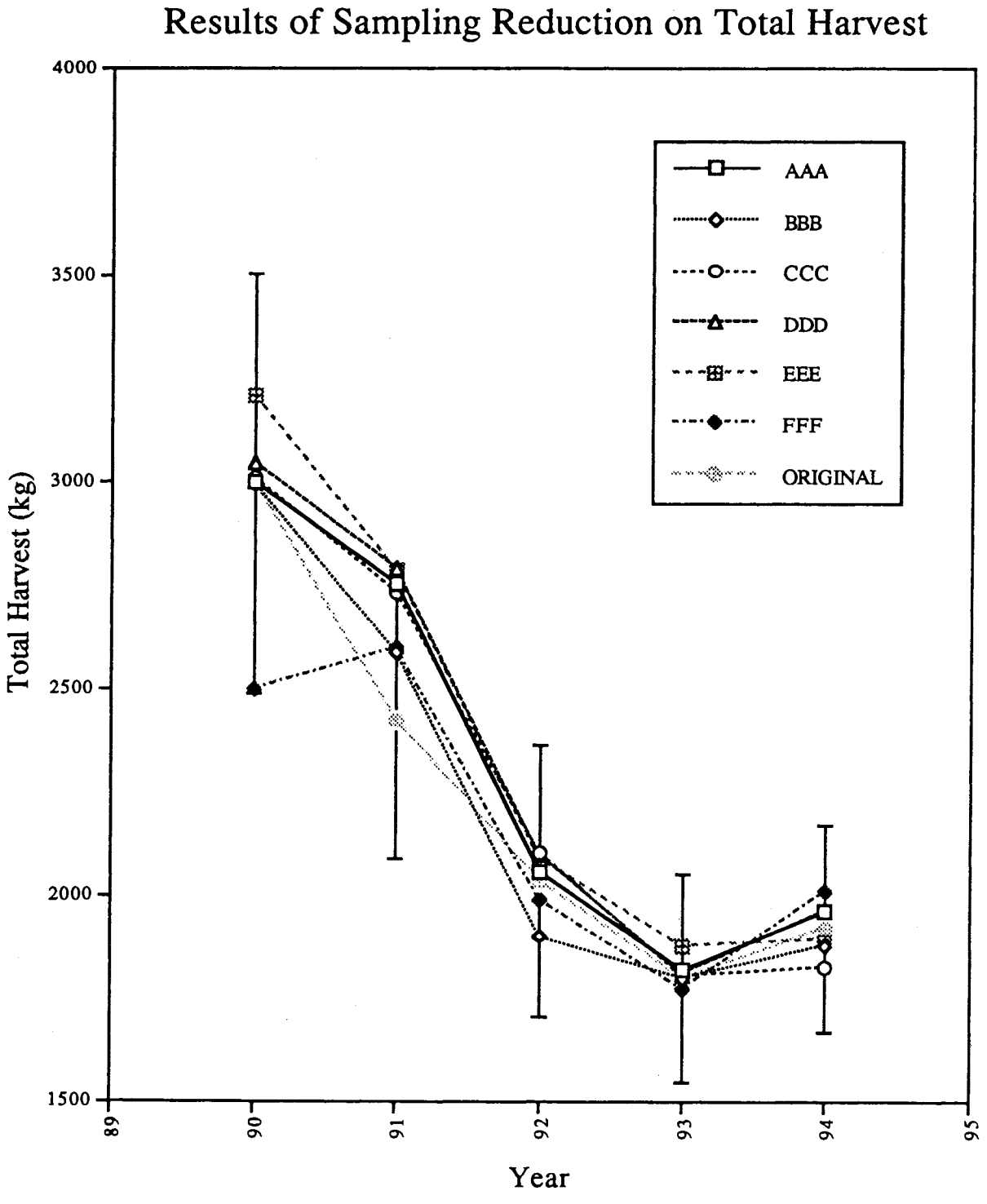

Figure 1.12. Six runs of re-analyzed total harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

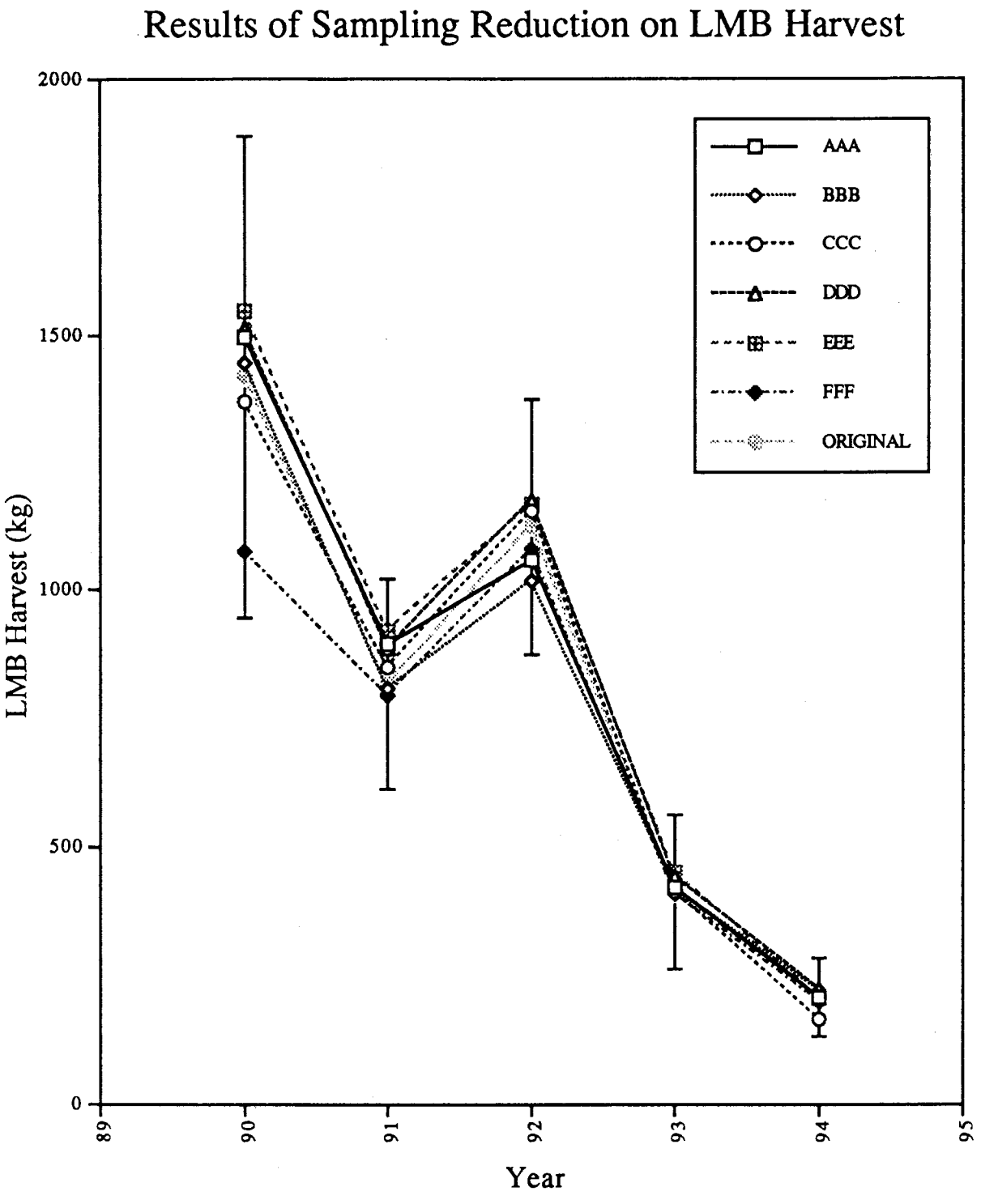

Figure 1.13. Six runs of re-analyzed LMB harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

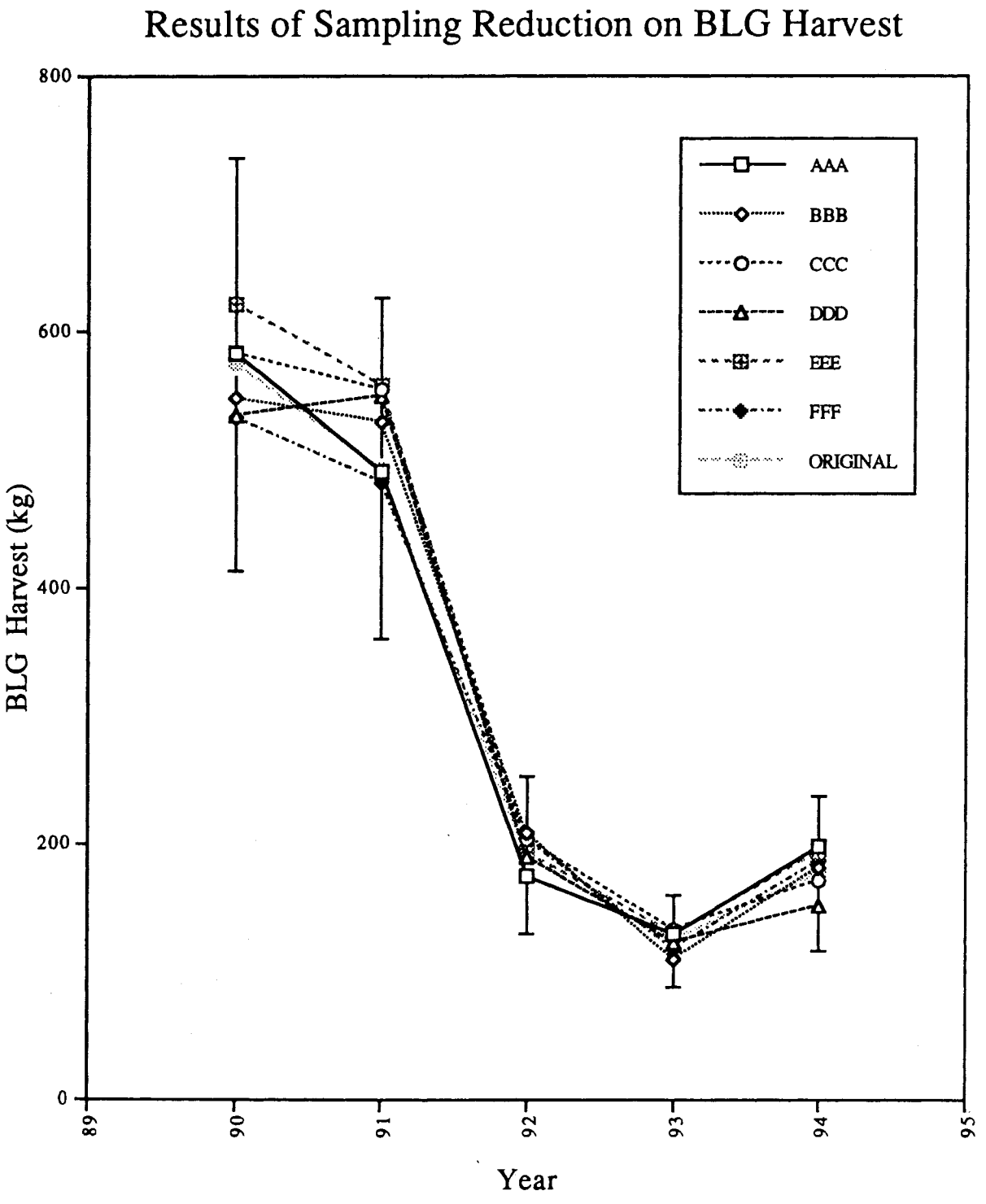

Figure 1.14. Six runs of re-analyzed BLG harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

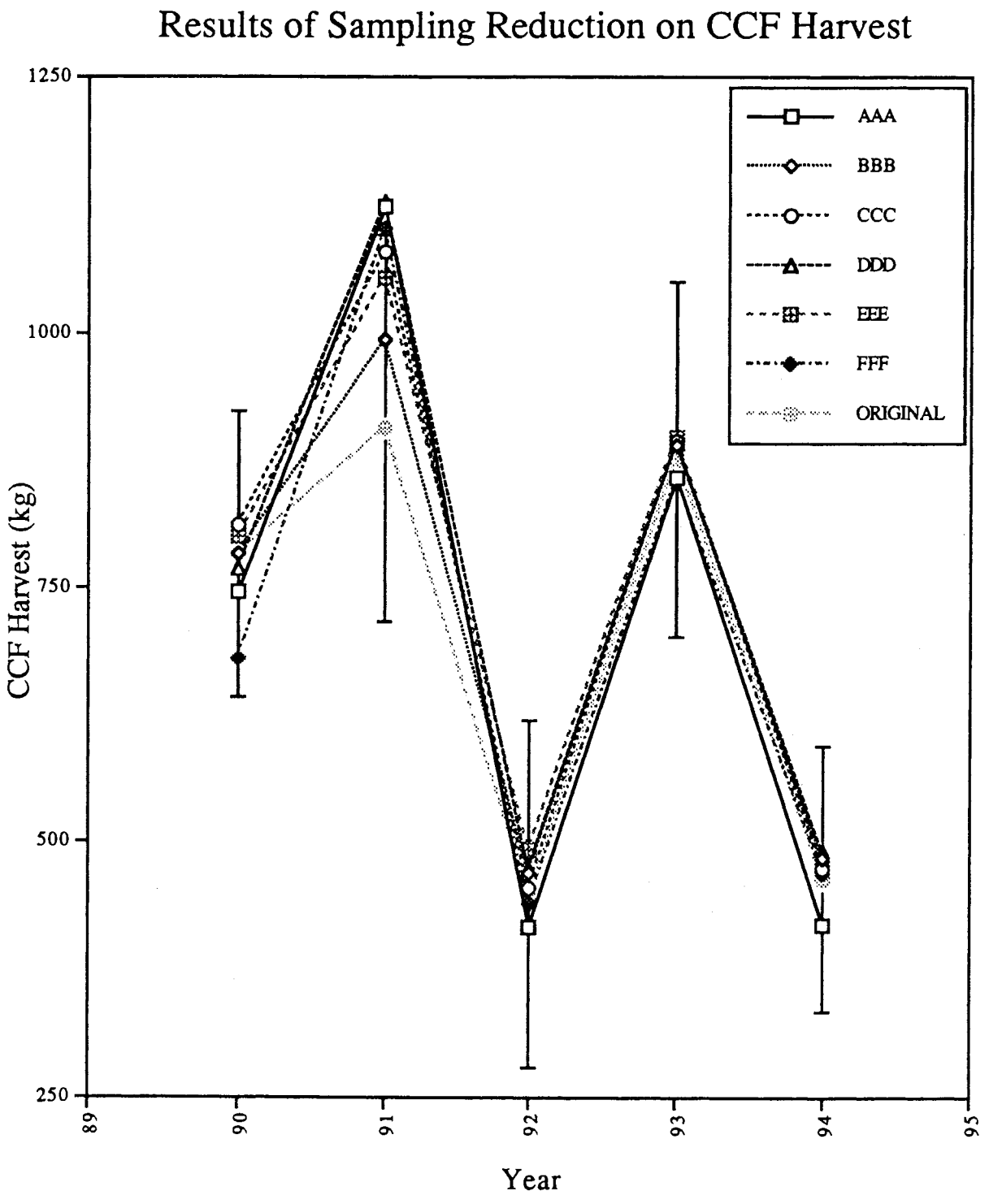

Figure 1.15. Six runs of re-analyzed CCF harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

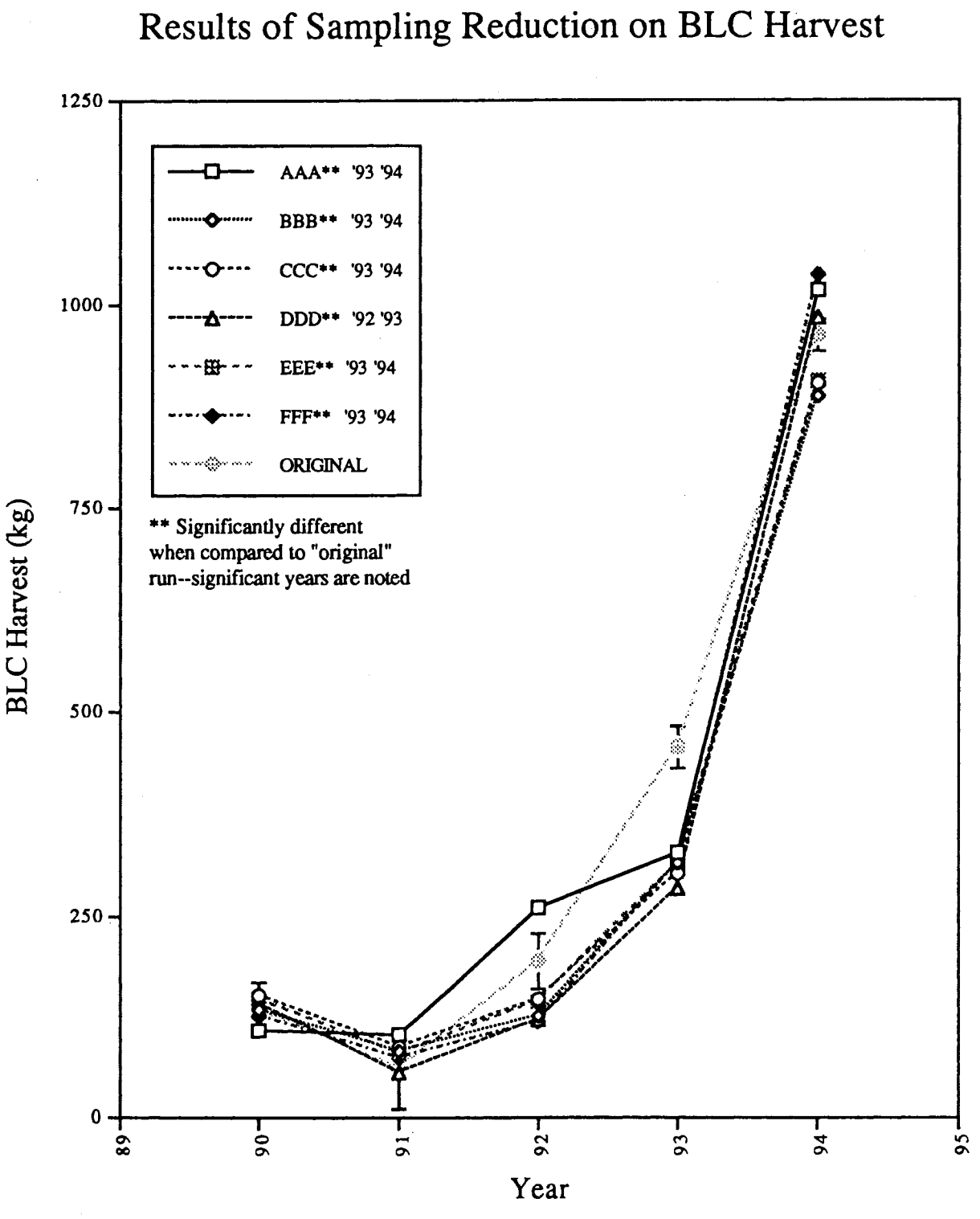

Figure 1.16. Six runs of re-analyzed BLC harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

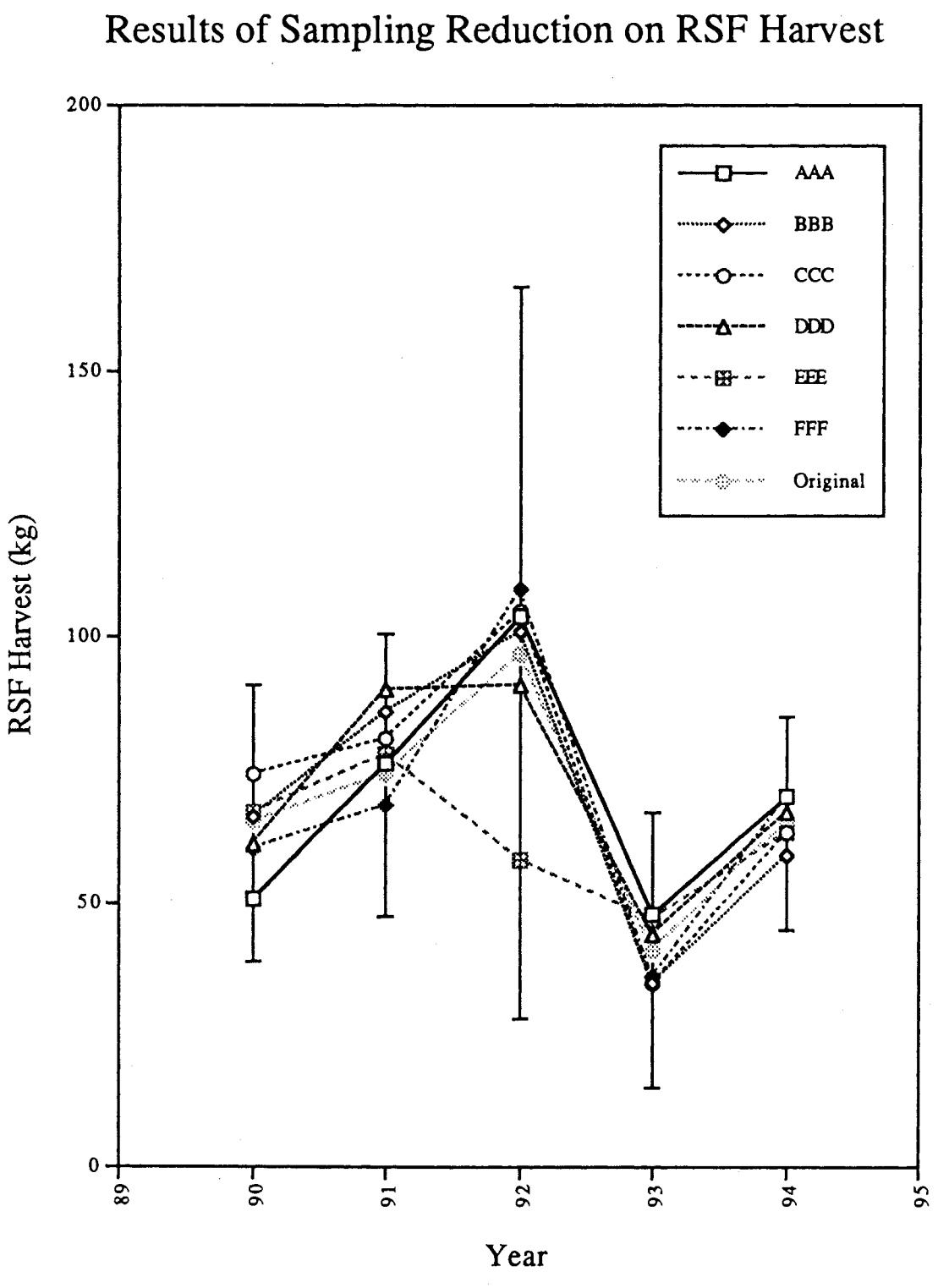

Figure 1.17. Six runs of re-analyzed RSF harvest data representing a 15% reduction in available shifts. Error bars are 95% confidence intervals of original data.

Table 1.1 Reduction of sampling ratio from random re-sampling. Reduction was accomplished by excluding three letter code representing 15% of original dates sampled. Original sampling percentage represents overall % of all possible shifts

			Exclusion Code					
Lake	Year	Original	AAA	BBB	CCC	DDD	EEE	FFF
		%Samp.	%Samp.	%Samp.	%Samp.	%Samp.	%Samp.	%Samp.
Weldon	1990	48.5	41.8	41.7	41.7	41.5	41.5	41.5
Weldon	1991	41.0*	34.7	34.3	33.9	34.6	34.7	34.3
Weldon	1992	46.8	40.7	39.8	40.3	40.3	40.1	40.1
Weldon	1993	47.8	41.0	41.0	40.7	41.0	40.9	40.9
Weldon	1994	45.7	38.6	39.0	39.7	39.5	39.2	39.0

*Sampling was reduced this year due to early closure of lake.

Job 101.2 Fisheries Database Enhancement

Objective: Refine TABLEOUT output program for use with lake (FAS) and streams databases, and beta test with selected Illinois Department of Natural Resources personnel. Prepare data entry program for lakes data. Transfer operation of the current database system, plus TABLEOUT and lake data entry program to the Illinois Department of Natural Resources. Support and Advise on the operation of and troubleshoot any problems regarding the lake or stream databases.

Summary of Segment 9 Activities:

Significant enhancements were made to the FAS lakes database (FAS-LAKES) system during this segment. Most significant is that the Apple //e / DOC9 district-based system for entry, analysis, and management of standard IDNR fish population sample data was fully transferred to the PC platform with Paradox for DOS v. 4.0 replacing General Manager as the district database management software. Modifications to the design of the FAS-LAKES database, including the merger of the database tables for individual fish length:weight data and that for age data, were made to improve the access speed and the storage efficiency of district and statewide databases. Changes to the database were also made to enhance integration of FAS-LAKES with other Paradox data tables, such as stocking and fish species distribution records, maintained by IDNR-Fisheries.

To make FAS-LAKES a fully functional package for IDNR field managers, new MSDOS-based software for data entry and analysis was written for field managers. A new menu-driven data entry program, Lake Enter, was developed using Borland's Paradox Application Language (PAL). Written as a Paradox script, LAKE ENTER presents users with a wide range of options including: data entry, an option to view and edit data as specified by the program's data selector, the option to create species length-frequency age histograms and length:weight scatterplots using Forth Graphics, a feature to select data for export to the tabular output program FISHTAB, as well as full access to Paradox for DOS. FISHTAB, the tabular output program evolved from the old TABLEOUT program, was also finally distributed to IDNR-Fisheries personnel during this segment after extensive revisions and testing. FISHTAB

includes functional modules for creating Length:Weight Condition summary tables for a selected species, using user-defined length intervals; Catch Per Unit Effort summary tables which report CPUE for each species collected during user-selected sampling trips, with CPUE reported as fish frequency or biomass and summarized by sampling run or by gear and station; a species abundance summary table; and a stock indices summary table, which provides PSD, RSD, and YAR calculations for a selected species, based on samples from a single lake : year selection, from multiple lake samples for a single year, or multiple years of sampling for a single lake.

Management of the FAS-LAKES and FAS-STREAMS databases was transferred to the IDNR-Fisheries Analysis Section during Segment 8 of this project, however project personnel worked closely with the Fisheries Analysis System in developing the new FAS-LAKES software for PCs, as well as in training IDNR personnel on the new system. During Segment 9 personnel from that section, in cooperation with INHS project personnel, conducted regional training sessions for the FAS-LAKES data entry program as well as the basics of Paradox for DOS (late 1995), followed by training sessions for the tabular and graphic output programs (FISHTAB and FORTH graphics), conducted early in 1996. During the data entry training, each district and regional manager was also provided with a subset of the statewide FAS-LAKES database encompassing the historical fish population data for their management area (district or region) that had been previously received as data from their old Apple*//e* DOC9 system. Managers also received a blank Paradox FAS-LAKES database specific for their district to use with the new Paradox data entry program for their 1995 fish survey data. User manuals were distributed at each training session detailing the structure of the FAS-LAKES database, the features of the FAS-LAKES data entry and output programs, as well as instructions for using each option within these programs. The latest version of this manual is included as a Volume 2 of this report (Sobaski and Gavrilovic, 1996). Technical support of the FAS-LAKES and FAS-STREAM packages continued throughout Segment 9 by INHS and Fisheries Analysis Section personnel.

Following training in the new FAS-LAKES system, the majority of district managers quickly made the transition to using this system on their PCs for data entry. To date these managers have provided fish population data from an additional 109 sampling trips made during 1995 for inclusion with the statewide database. Forty three of these data sets are from lakes new to the FAS-LAKES database, bringing the total number of lakes included in the database to 420, and the total number of sampling events to over 1600.

2.1 Overview of the development of a statewide database for fish population data

The genesis of the FAS-LAKES database system dates back to 1984 with Project F-46-R (Bayley and Austen 1987), when the District Fisheries Analysis System (FAS) was developed for Apple //e computers using the hierarchical database, General Manager, as well as a series of custom-written data entry and analysis programs. The major emphasis of this initial project was to provide IDNR fisheries managers with a comprehensive package for interpreting, managing, and analyzing the sample data that are routinely collected during lake fish population surveys. Once this system was adopted by district managers, design and implementation of a second database management system to consolidate these district data sets was initiated. The STATE-FAS database (Bayley and Sobaski 1987, Sobaski and Bayley 1990, and Sobaski and Bayley 1993) was a MS-DOS based relational database, developed using the commercial software package R:Base System V, that offered regional managers, state project administrators and researchers their first opportunity to investigate trends in Illinois fisheries on a broad geographic and temporal scale. A parallel database, maintained in the minicomputer database package INFO, allowed integration of these data with geographically referenced data sets developed in Geographic Information System package ArcInfo (ESRI, Inc.).

In an effort to keep these initial district and statewide database systems current with advances in computer technology, periodic revision have been made to the design of these databases. A number of computer and software upgrades have also been provided to district and project manager over the course of Project F-69-R. These include the purchase of PCs for all IDNR fisheries managers as well as the transfer of the STATE-FAS package from R:Base to the superior Paradox for DOS package in 1992. Over the past three segments of F-69-R, significant progress has continued in improving the management of state fisheries data. Parallel databases for creel summary data (Sobaski and Bayley 1993) and stream fishes (Bayley, Illyes, and Sobaski 1995) have been designed after the STATE-FAS system in Paradox and these continue to grow steadily. To distinguish the lake fisheries database from these complimentary statewide fisheries databases, the STATE-FAS database was renamed FAS-LAKES, with the creel database referred to as FAS-CREEL, and the streams database as FAS-STREAMS in 1995.

This change in name is appropriate since it also signifies a major revision in the district fisheries analysis system. The completion of Segment 9 brought to a close the Apple //e era of database management for district managers. After several years of developing and testing a full featured data entry and analysis package for PCs, compatible with the databases maintained in Paradox for DOS, a major goal of this current project was achieved with the release of the FAS-LAKES Lake Enter and FISHTAB programs to IDNR managers in 1995. A revised version of the FAS-LAKES database accompanied the release of the data entry software, with many district and regional managers receiving their first version of historical lake fisheries data from the FAS-LAKES statewide database specific for their management area. A detailed description of the up-to-dated FAS-LAKES database structure, the companion data entry, tabular output and graphical output programs, as well as the new protocol for exchanging data between district and state databases, is presented in Volume 2 of this report. The following discussion reviews the most significant changes to the FAS-LAKES database and describes features of the new data entry and analysis software for FAS-LAKES .

2.2 Modifications to the FAS-LAKES database

Although the design of the statewide lake fisheries database is essentially the same as reported in 1993 (Sobaski and Bayley), basically mirroring the original General Manager/DOC9 design used in the Apple //e system, three significant design changes have been made to the FAS-LAKES database to enhance its compatibility with other Paradox databases developed by IDNR-Fisheries as well as to make the database more appropriate for use by district managers. Rather than maintaining separate tables for individual fish length weight records (DSCREEN8 in STATE-FAS database) and individual fish age records (DSCREEN9 in STATE-FAS), these have been merged into a single database table
in FAS-LAKES (Screen 8). The merger of all measurements related to a single fish into a single record was taken to improve the speed and ease of querying the FAS-LAKES database as well as entering field data, while reducing the redundancy of information within the database. This change reduced the number of principal data tables to eight, with five ancillary tables within FAS-LAKES providing related information specific to individual lakes, fish species, Illinois counties, sampling gears, or season codes.

In order to increase compatibility of FAS-LAKES with other existing IDNR-Fisheries databases, LAKEDIST, the original data table devoted to lake specific information, such as

geographic location, morphometry, and physio-chemical characters, was replaced by a IDNR data table WATERS. WATERS provides the full complement of data previously stored in LAKEDIST, as well as information related to lake management, such as ownership, site regulations, and site contacts. Most importantly, it serves as a reference for the unique water number assigned by IDNR to all state managed waters.

The five digit IDNR water number has been an essential element in the other significant design change to the FAS-LAKES database. The key linking field that represented unique combinations of lake-year-season- and sampling station, FCODE, has been replaced by a more meaningful code, ID. While the value of FCODE was easily ascertained in the STATE-FAS database by referencing records in the DSCREEN4 table, the face value of FCODE by itself was meaningless. These codes were assigned in the order that data sets were uploaded to the statewide database, essentially making them serial codes in nature. The replacement sample ID field continues to represent the same four elements represented by FCODE. However, values for these four data fields now compose the value of this key linking field. ID is a 13 character record composed of the five digit water number of the lake sampled, followed by a period for improved readability, the four digit year of the sample, the two digit season-sampling trip code used in the DOC9 system and finally the single digit representing the lake station sampled. This combination of characters insures that each record accurately entered into a district FAS-LAKES database will maintain its unique identity, thereby avoiding the problem of several managers choosing the same linking code value for different sampling events. It also allows managers to view records within their lake chemistry (Screen 5), sample run (Screen 6), species length frequency (Screen 7), or individual fish measurement (Screen 8) tables without necessarily having to create a multi-table query within Paradox to recognize the lake, year, and sampling event where those data were collected.

One last improvement to most of the data tables within FAS-LAKES is the use of Paradox keys for all of the tables storing sampling trip data (e.g., water chemistry, sample run information, and fish measurement data). Keying creates an internal index of a data table's records based upon unique combinations of fields within that data table. When a Paradox query is executed the keys of any table involved in the query is immediately referenced, thereby significantly decreasing the processing time in generating an answer.

2.3 Conversion of the fisheries data entry and analysis software to a PC platform

Transformation of the district fisheries management system from Apple //e computers to Intel / Paradox for DOS based personal computers has involved four major steps. The first of these was the design modification made to the statewide FAS-LAKES database, to make it appropriate for use at the district level. This restructuring also required the merger of existing database records for individually measured and aged fish, prior to the distribution of district subsets of revised statewide database. The remaining, difficult steps required for adapting the DOC9 system for PCs involved reprogramming the full suite of DOC9 data entry, tabular, and graphical analysis programs.

Although work on a comprehensive fisheries analysis and tabular output program began as early as 1993 with the program TABLEOUT (Sobaski and Bayley 1993), and progressed during the development of a statewide stream fisheries database in F-120-R (Bayley, Illyes, and Sobaski 1995), the complexity of this program made the correction of its numerous flaws extremely arduous. Given the protracted nature of the revision process, a decision was made during Segment 9 to radically overhaul the program, while attempting to retain its originally designed functionality. The result, happily, was the release of a basic version of FISHTAB early in 1996.

FISHTAB is a DOS executable program, written to function independently of Paradox. Independence from the Paradox database management software has been considered essential, since this should provide some degree of flexibility to the FAS-LAKES system in the event that the system migrates to another database package, such as the transition made from R:Base to Paradox to DOS. Written in 32-bit C, thereby overcoming many of the memory constraints of the earlier version of the program, FISHTAB can analyze single sample data sets much like the DOC9 analysis programs, or large data sets of samples from multiple lakes and or multiple years. Output options include a species abundance table, species specific length frequency condition tables, summary tables of catch per unit effort, and stock indices tables including proportional stocking density (PSD), young:to:adult ratio (YAR), and user defined relative stocking densities (RSDs).

Data input for FISHTAB consists of a standard ASCII text file of fish length frequency data,

that is automatically generated from the FAS-LAKES database through an option of the data entry program. A selector in FISHTAB, similar to the Select Criteria module of the DOC9 system, permits users to specify subsets of data for analysis. Selection criteria include lake, year, sampling gear, and species. The length frequency condition table of FISHTAB summarizes single species data by user-defined length intervals (either single centimeter, even multiple centimeter, or user defined groupings) and reports total abundance, corrected for subsampling, average fish weight in English and metric units, and mean condition, expressed as LeCren's Condition index (Kn) and as relative weight (Wr). Catch Per Unit Effort (CPUE) appears as two menu options of FISHTAB. The first reports CPUE for all species of fish present in the sample(s) being analyzed, as number of fish per unit effort. The latter reports CPUE as the total weight of fish (kg or lbs) taken per unit effort. Depending on whether a single gear has been specified in the selector, CPUE is reported as a mean value for each gear and sampling station combination (not selected) or as a series of raw CPUE values for each sampling run (single gear selected). The stock index table reports standard stock density indices for individual species, with the option of reporting these results by year for a series of years for a single lake data set, or by lake for a series of lake data sets for a given year.

Prior to the release of FISHTAB, a Paradox PAL program for FAS-LAKES data entry, LAKE ENTER, was written and distributed late in 1995. Based on the data entry module developed for FAS-STREAMS, LAKE ENTER provides an easy and consistent method for field managers to enter sets of fish survey data into their district FAS-LAKES database. A series of selectors permits users to either type in or specify the correct lake, year, season, station, and species for the data set being entered. A series of Paradox data entry forms, resembling the format of field data sheets and modified for trapping data entry errors, are displayed leading the user through each table of the database. LAKE ENTER, through its data selector, also allows users an efficient way to verify and edit data as well as generating data sets for analysis with FISHTAB. Users may also readily access all of the features of Paradox for DOS through the LAKE ENTER menu.

One last option in LAKE ENTER allows users access to the new version of the FORTH Graphics program used in the DOC9 system. Although this initial version of graphics is limited to generating length frequency age histograms for a single species or length:weight scatterplots, continued programming on this last element of the FAS-LAKES package should provide a full-featured version to users by the fall of 1996.

As with any new software package; error corrections, refinements, and the addition of new features will be an continual process with these programs. On-going technical support from IDNR-Fisheries Analysis Section and project personnel at the Illinois Natural History Survey will remain available to assist IDNR personnel in the transition from their Apple //e system. The user's manual for the new, PC-based FAS-LAKES system is presented as Volume 2 of this report (Sobaski and Gavrilovic 1996). It thoroughly describes the features of these programs as well as presenting users with instructions for each program.

2.4 Future development of the FAS-LAKES database

With the completed transition of the FAS-LAKES database system to a PC platform and the continued development of the historical management database (see Job 3), the creel summary database, and the stream fisheries database, fisheries managers, planners, and researchers in Illinois are gaining an unprecedented potential for evaluating trends in the state's fisheries as well as assessing the effectiveness of management practices (see Job 4). To make these systems even more valuable tools in the future, approaches for enhancing these database systems are now being investigated by the IDNR Division of Fisheries personnel. Two pilot projects are especially worth noting. The first of these is examining ways to integrate the FAS-LAKES and FAS-STREAMS databases with statewide GIS data (such as the lake morphometry coverages developed during F-69-R or data from the Illinois Streams Information System) to create an easy, menu-driven, visual interface for users to access data without requiring extensive foreknowledge of database structures or software functions. The model for this system is being developed with for PCs, using the GIS software package PC-ArcView (ESRI, Inc.) and dBase versions of the FAS-LAKES and FAS-STREAMS databases. Internet access to Illinois fisheries data is also being developed through the Multistate Aquatic Resources Information System (MARIS) project. A summary set of FAS-LAKES CPUE data is serving as one of several test data set in the development of a model system for on-line query and retrieval of fisheries data. Participants include six Midwestern state natural resource agencies as well as the NRCS, USFS, NBS, and the USFW.

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Job 101.3 Historical Database Development and Lake Documentation

Project Objective: Obtain good quality historical fish population monitoring data for selected lakes and input into FAS. Develop comprehensive lake management histories for lakes and incorporate into the Fisheries Analysis System (FAS). Continue environmental documentation of new lakes as they are added to FAS.

Segment 9 Objective: Input and verify remaining historical management data from approximately 30 lakes into FAS. Input and verify remaining historical fish population data from approximately 20 lakes into FAS. Update fish stocking information and develop database tables for state regulations. Process remaining physico-chemical data on lakes surveyed during 1994 and collect data on additional lakes as requested.

Activities to meet the above objectives consisted of data collection, database development, selection of lakes for management evaluation, and preliminary analyses towards evaluating sport fisheries management activities. These activities are described in the following sections.

3.1. DATA COLLECTION

Data pertaining to lake management history (fish stocking, vegetation control, site regulations, water temperature recordings) and fishery sampling (all fish species collected) were gathered during 1993 and 1994. All Illinois Department of Natural Resources (IDNR) Fisheries District offices were visited during this period. During each visit, pertinent field data were examined and photocopied for computer entry in Champaign. District managers were also interviewed to discuss the management and general history of lakes within their district and to gain insight into the methodolgy and quality of fish population sampling, especially in terms of sampling frequency and consistency of sampling sites and procedures used at those lakes. Lakes with good data sets, as well as lakes with data of marginal quality, were included in the collection process. Copies of all field sheets or data summaries collected and entered into the FAS database were archived and stored for future reference. A list of the 184 lakes included in this data collection is provided in Table 3.1. Data from a total of 1,735 samples (lake-years) were gathered. For the majority of lakes, data sets extend from the present back to the 1960's, with a few data sets extending as far back as the 1950's.

Morphometric and limnological (total phosphorous, soluble ortho-phosphate, nitrate, nitrite, water temperature/dissolved oxygen depth profiles, conductivity, alkalinity, and turbidity-Secchi and NTU) data were also collected during the summer of 1994 on 12 state managed impoundments: Anderson Lake, Busse Lake, Cedar Lake, Clear Pond-Kickapoo State Park, Gladstone Lake, Greenfield City Lake, Johnson Lake-Banner Marsh, Mauvaise Terre Lake, Sam Dale Lake, Silver Lake, Lake Storey, and Lake Taylorville. Sonar data from these lakes were interpreted and digitized, following the methodology of Austen, et al. (1993), to create a GIS bathymetric coverage of each lake. A total of 155 lakes have now been mapped and limnologically characterized for the FAS as part of F-69-R.

3.2. DATABASE DEVELOPMENT

Paradox data tables, as described in Sobaski et al. (1995), were designed or adapted from the existing IDNR-Fisheries fish stocking database and implemented for storing lake management history and environmental data (**LAKEHIST**), site-specific and statewide fishing regulations (**FISHREGS**), and fish stocking records (**STOCK**) (Tables 3.2 through 3.6). Information from historical fish population surveys were entered into a separate set of data tables matching the structure of the FAS-LAKES database described within Job 101.2. Once data verification has been completed, copies of these tables will be transferred to IDNR-Fisheries to be merged with the current FAS-LAKES database. Likewise, fish stocking records collected from the Illinois Fisheries District offices will be appended to the state hatchery database, after checking for any duplication of existing database records. The entry of sport fishing regulations from the past through the current year will likely continue through August of 1996. Data on site-specific regulations extend back to 1984, while statewide regulation data exists to as early as 1930. However, the set of statewide regulations is not complete for all years.

Computerization of the historical lake management and fish sampling data began in 1994 using a data entry application developed in the programming language Clipper. Entry of an initial core set of data from 140 lakes (1,577 annual data sets) was completed by the end of 1995. Historical data from other state managed lakes within FAS-LAKES will be added to this database in the future.

3.3. SELECTION OF LAKES

In the data collection phase of Job 101.3, lakes were selected based on frequency of sampling and consistency of sampling procedures. Lakes sampled sporadically, i.e., once every ten or more years, were generally excluded from this initial collection. All information pertaining to the management and fish sampling history of selected lakes was photocopied for data entry. In cases of data of dubious quality (apparent errors or missing information) data records were entered, but flagged with an appropriate comment describing the problem.

As part of the preliminary analysis of management data (Section 3.4), the present historical database will undergo a thorough quality check to verify records for accuracy and completeness. In cases of missing information (e.g., years without fish sampling, sampling procedures records missing effort information) a second interview will be conducted with the district manager in an attempt to complete the data set. In cases where satisfactory effort and catch information is unavailable, those lake will be omitted from the analysis process.

3.4. PRELIMINARY ANALYSES

The overall goal of the analysis process to be conducted on the databases is to address the relative importance of natural and anthropogenic factors in resource management. The general objective is to evaluate fishery management methods practiced over the past 30 years to provide insight into the improvement or maintenance of long-term quality sport fishing in Illinois lakes. The impact of environmental factors on fish population fluctuations will also be investigated. Due to the unacceptable data quality of some lakes, not all of lakes entered in FAS (Table 3.1) will be considered in this analysis process. Lakes with unacceptable data quality, however, were entered into FAS for purpose of future reference. These additional data may prove useful in eventual research and/or management questions uncoupled from the ones here presented.

All lakes have different levels of management intensities. At one extreme are lakes that supply water for human consumption. These tend to be minimally managed, except for stocking sportfish and/or regulation of fishing. At the other extreme are lakes where many different management interventions are practiced over a single year, with some interventions occurring as frequently as every year over a 3-5 year period.

Largemouth bass (*Micropterus salmoides*) (LMB) will be the prime species of interest throughout this project. Other species will be excluded from consideration due to the manner in which fish sample data were recorded prior to 1985. Samples before 1985 were typically reported as the total numbers of fish caught by all sampling gears combined. Since sampling gears varied in different years, analyses of these data would be confounded by changes in collection methods. Largemouth bass, however, are primarily collected by electrofishing. Based on an analysis of available data, no more than 3% of all largemouth bass are caught by all other gears combined.

Catch-per-unit-of-effort (CPUE) (here defined as numbers of fish caught per minute of electrofishing sampling in the fall) of legal-size fish will be the response variable considered initially. CPUE will be calculated as the total number of LMB > 20-cm collected during a lake sampling divided by the total time of electrofishing conducted by the district biologist. Management actions will comprise some of the independent variables. Management actions considered here include any stocking of LMB (regardless of size), fish removal, water level manipulation, aquatic vegetation control, lake habitat modification, lake fertilization, lake rehabilitation, and sport fishing regulations for LMB. The following null hypotheses will be tested based on the data above using various response variables related to the conditions of LMB populations:

1. management practices related to habitat modifications do not have an effect on LMB population.
2. regulations restricting LMB harvest do not have an effect on LMB population.
3. LMB stocking practices do not have an effect on LMB population.
4. temperature does not have an effect on the LMB populations.
5. precipitation does not have an effect on the LMB populations.

A more detailed description of the data available and proposed analyses follows.

3.4.1 Data Sources and Analyses

Anthropogenic and environmental effects will be the two major factors in investigating fluctuations of LMB populations.

3.4.1.1 Data Sources for Anthropogenic Effects

Fish length-frequency data are available for each lake managed by the state and are archived in IDNR-Fisheries District offices throughout the state and in the FAS-LAKES database. Management histories pertaining to habitat modifications and LMB stockings have been obtained from the IDNR Fisheries District offices. Records of state regulations limiting the size and quantity of harvestable LMB have/will be obtained from the State of Illinois Library, University of Illinois Urbana-Champaign Law Library, State of Illinois Archives, and from individual collectors.

3.4.1.2 Data Sources for Environmental Effects

Weather reporting stations throughout Illinois collect data for the Midwest Climate Information System database. Average monthly precipitation and rainfall data for 211 weather stations throughout the state are available for all years since 1948. These data are available to the public and maintained by the Illinois State Water Survey.

3.4.2 Analytical Procedures

LMB will be the main species of interest throughout this project. CPUE of legal-size fish will be the response variable initially considered. Young LMB will not be considered since their numbers are more dependent on spawning success, and egg and juvenile survival, both of which are too sensitive to short-term stress, thus making young fish numbers fluctuate more erratically (Eipper 1975; Sabo and Orth 1995).

Time series methods will be used with data sets where autocorrelation and/or seasonality exist. These models will be used in filtering such data sets to obtain a sequence with an independent and identically distributed error structure, thereby permitting use of a broader range of analytical methods (methods based on independent observations). Also, the structure of data from lakes with long data series will be evaluated with time series methods. Autoregressive moving average (ARMA) models will be applied to individual lakes to allow for inter-lake comparisons. Changes in the nature of the structure of a given data series will be investigated as an initial indication of the influence of management practices on LMB populations, since lakes with

different management intensities will be considered in this preliminary analysis. Since time series methods need a minimum of 50 observations to provide acceptable power (Box and Jenkins 1976), this method will not provide definitive answers, but may provide useful initial results. For more conclusive results, data will be analyzed using a Before/After approach. Data taken before a given independent variable change will be compared to data collected when that variable has changed for one (pulse event) or multiple years (press event) (Underwood 1991, 1994).

There are eight possible arrangements of replication and interventions to lakes. A lake may have replicates or not, a given management practice can occur once or more over the time span of available data, and management interventions of different types may occur at several or single lakes. A variety of statistical tests will be employed in analyzing the available data set, depending on the lake replication, management intervention scenario (Table 3.7). A student t-test and a superposed epoch analysis (Prager and Hoenig 1992) will be used in single lake cases and a one-time management intervention, a 2-way r-m AOV (Ende 1993; Gurevitch 1986) for several lake cases and a one-time or multiple-time management intervention, a one-way r-m AOV for single lake cases and multiple-time management interventions, a factorial r-m AOV for several lake cases with multiple replicates and multiple-time management interventions of different kinds.

3.4.3 Analysis of Environmental Effects on LMB Populations

3.4.3.1 Background Information on Environmental Effects

The effects of non-human causes on population fluctuations have been attributed mostly to climatic anomalies. In investigating the reduction in numbers of breeding ducks in the Canadian prairie-parklands, Bethke and Nudds (1995) reported significant climatic effects on wetland losses and a correlation between wetland losses and duck declines. In fisheries, off-shore wind patterns and winter water temperatures were shown to be correlated with the year class strength of haddock (*Melanogrammus aeglefinus*) from Georges Bank (Chase 1955), wind patterns were shown to correlate with cod (*Gadus morhua*) and haddock stock abundance from the Nova Scotian Georges Bank (Koslow et al. 1987), and salinity was found to be correlated with Atlantic cod recruitment (Myers et al. 1993). Castillo et al. (1994) found recruitment variation of petrale sole (*Eopsetta jordani*) to be correlated with oceanographic conditions for periods when egg and larval abundance are high, suggesting that year class strength is determined during a narrow range in the year. Recruitment of cod has also been positively correlated with that of haddock and herring (*Clupea harengus*) for 14 stocks of fish from Georges Bank (Koslow, 1984), suggesting biological factors to play a role in year class strength of fish. LMB population densities of fish larger than 100 mm were shown to be positively correlated with maximum summer temperatures in Missouri streams and densities of young-of-the-year smallmouth bass were shown to be positively correlated with water temperature, but not with parental stock size in Nebish Lake, WI (Serns 1982).

3.4.3.2 Analytical Procedures

Data on temperature and precipitation will be included in a second series of analyses to examine the influence of climate on the abundance of LMB larger than or equal to 350-mm. Each lake will be associated with the closest weather station, within the catchment basin of the lake, recording complete climatic data. If the closest station does not offer a complete data set, the next closest station will be chosen. As a more powerful analysis, anomalous events (defined here as twice the standard error of the mean for the period of reported observations) in either the temperature or precipitation series will be evaluated following the procedures described above for anthropogenic effects.

Whenever possible, the analyses pertaining to natural and human-caused interventions will not be separated. This will allow for interaction estimation between management actions and natural events.

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Table 3-1. List of lakes and years of historical data entered into the FAS-LAKES system as part of Job101.3.

Lake	IDNR District	IDNR Region	County	Years of Data Entered
ALLISON LAKE	17	4	Logan	1987, 89, 91
ANDERSON LAKE	5	1	Fulton	1958, 60, 61, 63, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85
APPLE CANYON LAKE	1	1	Jo Daviess	1975, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93
ARGYLE LAKE	4	1	McDonough	1958, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 91, 92, 93
ARROWHEAD HEIGHTS LAKE	15	4	Adams	1986, 87, 88, 90
ASHLAND NEW RESERVOIR	16	4	Cass	1989, 90, 91
AUGUSTA LAKE	15	4	Hancock	1960, 61, 63, 65, 66, 67, 68, 69, 70, 71, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 87, 88, 90
BAKERS LAKE	2	1	LaSalle	1991
BALDWIN LAKE	21	4	Randolph	1969, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89
BANANA LAKE (LCFPD)	8	2	Lake	1987, 89, 91
BEALL WOODS	23	5	Wabash	1973, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 86, 87, 88, 90
BEAVER (LANG)	11	2	Kendall	1978, 79, 80, 84, 85, 87, 88, 91
BEAVER DAM LAKE	18	4	Macoupin	1972, 73, 74, 75, 81, 83, 85, 86, 87, 88, 89, 90, 91
BORAH LAKE	23	5	Richland	1985, 87, 88
BRAGG POND	14	3	Moultrie	1981, 83, 86, 89
BRAIDWOOD LAKE	10	2	Will	1984, 85, 86, 87, 88, 89, 90, 91
BRUCE POND	14	3	Moultrie	1980, 81, 82, 83, 84, 85, 86, 89

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
CAMPUS POND - COLES COUNTY	14	3	Coles	1987, 90
CANTON LAKE	5	1	Fulton	1964, 65, 66, 67, 68, 69, 70, 71, 72, 73, 77, 78, 82, 87, 92
CARLYLE LAKE	32	0	Clinton	1963, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 86, 87, 88, 89, 91
CARTHAGE LAKE	15	4	Hancock	1960, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 86, 87, 88, 89, 90, 91
CHANNEL LAKE	8	2	Lake	1955, 66, 67
CHANUTE AIR FORCE LAKE	12	3	Champaign	1988
CHARLIE BROWN LAKE	22	5	Clay	1989, 90
CLINTON LAKE	13	3	DeWitt	1979, 80, 81, 85, 87, 88, 89, 90, 91
COFFEEN LAKE	20	4	Montgomery	1964, 66, 67, 68, 69, 71, 75, 77, 86, 87, 88, 89, 90, 91
COLES COUNTY AIRPORT LAKE	14	3	Coles	1979, 81, 91
DAWSON LAKE	13	3	McLean	1963, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 75, 76, 77, 78, 79, 80, 81, 84, 85, 86, 87, 88, 90, 91
DEFIANCE LAKE	7	2	McHenry	1970, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92
DIAMOND LAKE	8	2	Lake	1980, 84, 85, 87, 89, 91
DOLAN STATE LAKE	24	5	Hamilton	1963, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 88, 89, 91
DREAMLAND POND	14	3	Macon	1987, 91
DRESDEN LAKE	11	2	Grundy	1986
EAST BRANCH RESERVOIR	7	2	DuPage	1988, 89, 91

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
EAST FORK LAKE	23	5	Richland	1985, 87, 88, 90
EAST RIVERDALE LAKE	7	2	DuPage	1989, 90
ELDER POND	14	3	Moultrie	1980, 81, 82, 83, 84, 86, 87, 88, 90
EMERALD LAKE - KSP	12	3	Vermilion	1986, 89
EMERALD POND	7	2	McHenry	1986, 88
EVERGREEN LAKE	13	3	McLean	1971, 72, 73, 74, 75, 77, 78, 80, 82
FARIES PARK POND	14	3	Macon	1987, 91
FINDLAY POND	14	3	Moultrie	1982, 83, 84, 85, 86, 89
FORBES LAKE	22	5	Marion	1971, 72, 73, 74, 75, 76, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
FOREST PARK LAGOON	14	3	Shelby	1985, 88, 91
FOUR LAKES	1	1	Winnebago	1962, 66, 67, 68, 70, 71, 73, 74, 75, 76, 77, 78
FOX CHAIN O' LAKES	8	2	Lake	1986, 88
FRANK HOLTEN LAKE #3	19	4	St. Clair	1959, 60, 61, 64, 65, 66, 67, 68, 69, 70, 71, 73, 84, 86, 87, 91
FRANK HOLTEN MAIN LAKE	19	4	St. Clair	1959, 60, 61, 64, 65, 66, 67, 68, 69, 70, 71, 73, 79, 84, 85, 86, 87, 89, 91
GAGES LAKE	8	2	Lake	1986
GEORGETOWN RESERVOIR	12	3	Vermilion	1988
GILLESPIE NEW CITY LAKE	18	4	Macoupin	1985, 87, 89
GILLESPIE OLD CITY LAKE	18	4	Macoupin	1987, 90
GLADSTONE LAKE	4	1	Henderson	1962, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 90

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
GLEN SHOALS	20	4	Montgomery	1980, 81, 82, 83, 85, 86, 89
GRASS LAKE	8	2	Lake	1965, 66, 67, 68, 69, 71, 73
GRAYSLAKE	8	2	Lake	1989
GREENFIELD CITY LAKE	18	4	Greene	1988, 91
GREENVILLE NEW CITY LAKE	20	4	Bond	1970, 72, 74, 77, 80, 81, 82, 84, 85, 86, 89
GREENVILLE OLD CITY LAKE	20	4	Bond	1988
GRISWOLD LAKE	7	2	McHenry	1959, 62, 63, 65, 73, 75, 81, 90
HEIDECKE LAKE	11	2	Grundy	1984, 85, 86, 87, 88, 89, 90, 91
HERRICK LAKE	7	2	DuPage	1988, 89, 91
HICKORY POINT GOLF COURSE	14	3	Macon	1987, 91
HICKORY RIDGE POND H.S.S.F.	14	3	Shelby	1979, 80, 82, 83, 84, 85
HIGHLAND OLD CITY LAKE	19	4	Madison	1987
HILLSBORO OLD CITY LAKE	20	4	Montgomery	1986, 89
HOLIDAY PARK LAKE	13	3	McLean	1989
HOMER LAKE	12	3	Champaign	1970, 71, 72, 73, 74, 75, 76, 77, 78, 80, 82, 83, 85, 86, 88, 91
HORSESHOE LAKE	25	5	Alexander	1959, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 87, 90, 91
HORTON LAKE	15	4	Hancock	1972, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 86, 87, 88, 89, 90, 91
HUNTER POND L.S.P.	14	3	Shelby	1982
IDOT LAKE	17	4	Sangamon	1984, 85

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
ISLAND LAKE	7	2	McHenry	1968, 69, 71, 73, 85, 91
JERICHO LAKE	7	2	Kane	1989, 91
JONES STATE LAKE	24	5	Saline	1964, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90
KING PARK POND	15	4	Pike	1971
KINKAID LAKE	25	5	Jackson	1970, 71, 72, 73, 74, 76, 77, 79, 81, 82, 83, 84, 85, 87, 88, 89, 91
KLEIN LAKE	7	2	McHenry	1990
KUHN PIT	7	2	DuPage	1989, 90
LAKE ATWOOD	7	2	McHenry	1987, 88, 89, 90, 91
LAKE BLOOMINGTON	13	3	McLean	1953, 58, 59, 61, 62, 66, 67, 71, 73, 75, 78, 80, 81, 82
LAKE CANDLEWICK	1	1	Boone	1975, 77, 78, 79, 80, 82, 85, 89, 90, 91, 92
LAKE CARLINVILLE	18	4	Macoupin	1961, 68, 74, 77, 82
LAKE CARROLL	1	1	Carroll	1975, 76, 78, 79, 80, 81, 82, 83, 84, 85, 86, 90, 92
LAKE DECATUR	14	3	Macon	1964, 71, 73, 74, 75, 80, 81, 82, 86, 88, 90
LAKE EUREKA	6	1	Woodford	1984, 88, 89, 90
LAKE GALENA	1	1	Jo Daviess	1976, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93
LAKE IN THE HILLS	7	2	McHenry	1988
LAKE JACKSONVILLE	16	4	Morgan	1959, 60, 62, 64, 66, 67, 72, 73, 74, 75, 77, 80, 83, 85, 86, 87, 88, 89, 90, 91
LAKE KAKUSHA	2	1	LaSalle	1991
LAKE LE-AQUA-NA	1	1	Stephenson	1956, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 91

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
LAKE MARIE	8	2	Lake	1986, 87, 88, 89, 90
LAKE MATTOON	14	3	Shelby	1979, 86, 88, 90
LAKE MENDOTA	2	1	LaSalle	1989, 90, 91
LAKE MILLIKEN	10	2	Will	1971, 72, 73, 74, 75, 76, 77, 78, 79, 80, 82
LAKE MINGO	12	3	Vermilion	1985, 86, 87, 88, 89
LAKE MURPHYSBORO	25	5	Jackson	1953, 55, 57, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91
LAKE NELLIE	22	5	Fayette	1983, 84, 86
LAKE PARADISE	14	3	Coles	1959, 66, 69, 73, 79, 86, 88, 90
LAKE PARADISE SHADOW PD #1	14	3	Coles	1986, 88
LAKE SANGCHRIS	17	4	Christian	1971, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 87, 88, 89, 90, 91
LAKE SARA	22	5	Effingham	1958, 59, 60, 61, 63, 67, 71, 73, 75, 77, 83, 84, 85, 86, 89, 90, 91
LAKE SHELBYVILLE	32	0	Shelby	1970, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 87, 88, 89, 91
LAKE SPRINGFIELD	17	4	Sangamon	1963, 72, 75, 77, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
LAKE STOREY	4	1	Knox	1955, 59, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 90, 91
LAKE VERMILION	12	3	Vermilion	1986, 89
LAKE WILLIAMSVILLE	17	4	Sangamon	1972, 73, 74
LAKE ZURICH	8	2	Lake	1985
LASALLE COOLING LAKE	2	1	LaSalle	1979, 80, 81, 82, 83, 88, 91

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
LINCOLN TRAIL LAKE	14	3	Clark	1958, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
LITTLE SISTER LAKE	5	1	Fulton	1973
LONE OAK POND	14	3	Moultrie	1980, 81
LONG LAKE	8	2	Lake	1991
LONG LAKE - KSP	12	3	Vermilion	1988, 91
LOON LAKE	8	2	Lake	1984, 85
LOW POND L.S.P.	14	3	Moultrie	1980, 81, 82
MARY'S POND	14	3	Moultrie	1980, 81
MASTODON LAKE	7	2	Kane	1991
MCCLURE POND	14	3	Moultrie	1979, 80, 81, 82
MCCULLOM LAKE	7	2	McHenry	1961, 62, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
MERMET STATE LAKE	26	5	Massac	1963, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 90
MILL CREEK LAKE	14	3	Clark	1980, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
MONEE RESERVOIR	10	2	Will	1986, 87, 88
MT. STERLING LAKE	15	4	Brown	1959, 60, 61, 63, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 86, 87, 88, 89, 90, 91
NEWTON LAKE	23	5	Jasper	1976, 77, 78, 79, 83, 84, 85, 87, 88, 89, 91
NO-NAME POND-KSP	12	3	Vermilion	1987, 89
OAKHURST LAKE	7	2	Kane	1989, 91

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
OAKLAND CITY LAKE	14	3	Coles	1959, 64, 65, 68, 69, 73, 79, 81, 82, 85, 86, 89, 91
OPOSSUM POND L.S.P.	14	3	Shelby	1980, 81, 82
OTTER LAKE	18	4	Macoupin	1985, 87
PANA LAKE	14	3	Shelby	1979, 85, 87, 89, 91
PARIS EAST LAKE	12	3	Edgar	1981, 82, 86, 88, 90
PARIS WEST LAKE	12	3	Edgar	1981, 82, 86, 88, 90
PETITE LAKE	8	2	Lake	1965, 70
PIERCE LAKE	1	1	Winnebago	1971, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 87, 88, 90
PISTAKEE LAKE	8	2	Lake	1965, 66, 67, 68, 69, 71, 74
PITTSFIELD LAKE	15	4	Pike	1961, 63, 64, 65, 66, 67, 68, 69, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
PITTSFIELD REARING POND	15	4	Pike	1987
POWERTON LAKE	6	1	Tazewell	1971, 72, 73, 77, 78, 80, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
RAMSEY LAKE	22	5	Fayette	1957, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74, 75, 76, 79, 81, 83, 84, 85, 86, 87, 88, 89, 90, 91
RANDOLPH COUNTY LAKE	21	4	Randolph	1960, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 79, 80, 81, 82, 83, 87, 88, 89
RED HILLS	23	5	Lawrence	1955, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90
REND LAKE	32	0	Franklin	1971, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 87, 88, 89, 91
RICE LAKE	5	1	Fulton	1956, 58, 61, 63, 65, 66, 67, 68, 69, 70, 72, 73, 74, 75, 76, 77, 78, 81, 82, 83

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
RINGNECK POND S.F.W.A.	14	3	Moultrie	1980, 81, 82
ROCK SPRINGS POND	14	3	Macon	1988, 91
ROUND LAKE	8	2	Lake	1966, 68, 72, 74, 76, 77, 79, 86
SAM PARR LAKE	23	5	Jasper	1972, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 85, 86, 87, 88, 89, 91
SAND LAKE	8	2	Lake	1985, 86, 87, 89, 91
SAND POND	10	2	Kankakee	1981, 82
SASSAFRAS POND H.S.S.F.	14	3	Shelby	1983, 84, 85
SAUK TRAIL	2	1	Henry	1957, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86
SCHUY-RUSH LAKE	15	4	Schuyler	1976, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
SILOAM SPRINGS	15	4	Adams	1956, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 86, 87, 88, 89, 90, 91
SOUTH SHIELD POND	14	3	Shelby	1980
SPORTSMAN CLUB POND	14	3	Macon	1979, 81, 91
SPRING LAKE	4	1	McDonough	1985, 86, 87, 88, 89, 90, 91
SPRING LAKE (NORTH)	6	1	Tazewell	1959, 61, 62, 63, 65, 67, 68, 69, 70, 71, 73, 74, 76, 79
SPRING LAKE (SOUTH)	6	1	Tazewell	1978, 79
STAUNTON CITY LAKE	18	4	Macoupin	1986, 89
TEN MILE GROVE MIDDLE LAKE	13	3	Ford	1990
TOMAHAWK LAKE	7	2	McHenry	1988, 90, 91
TRAVENOL POND	8	2	Lake	1991

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
TURNER LAKE-COLSP	8	2	Lake	1985, 86, 87, 88, 89, 90, 91
TUSCOLA CITY LAKE	12	3	Douglas	1982, 85, 87, 90
VALLEY LAKE	8	2	Lake	1990
VANDALIA LAKE	22	5	Fayette	1968, 69, 71, 73, 75, 76, 77, 82, 83, 84, 86, 88, 89, 90
VERNOR LAKE	23	5	Richland	1985, 91
VILLA GROVE EAST LAKE	12	3	Douglas	1990
VILLA GROVE WEST LAKE	12	3	Douglas	1981, 85, 87, 90
VIRGINIA CITY RESERVOIR	16	4	Cass	1987, 88, 89, 90, 91
WALNUT POINT LAKE	12	3	Douglas	1967, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91
WALTON PARK LAKE	20	4	Montgomery	1987
WASHINGTON COUNTY LAKE	21	4	Washington	1962, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 86, 87, 89
WAVERLY LAKE	16	4	Morgan	1961, 64, 69, 72, 74, 80
WEINBURG - KING LAKE #1	15	4	Schuyler	1975, 76, 77, 78, 79, 80, 81, 82
WELDON SPRINGS	13	3	DeWitt	1953, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 85, 86, 87, 88, 89, 90, 91
WEST TWIN LAKE	11	2	Kendall	1988
WHITE OAK POND H.S.S.F.	14	3	Shelby	1983, 84, 85
WILDERNESS LAKE	7	2	McHenry	1988, 89, 90, 91
WOOD DALE LAKE	7	2	DuPage	1989, 90, 91
WOOD DUCK POND S.F.W.A.	14	3	Moultrie	1981

Table 3-1. Continued

Lake	IDNR District	IDNR Region	County	Years of Data Entered
WOOD LAKE	17	4	Sangamon	1980, 81, 82
WYMAN LAKE	14	3	Moultrie	1979, 80, 81, 85, 87, 88, 91

Table 3-2. The structure of the Paradox lake management and environmental history data table, **LAKEHIST**. Each record represents a specific lake environmental or management event (e.g. fish kill, habitat alteration, plant or fish control).

Field #	Field Name Field Description	Type / Length
1	WATERNUM *IDNR-Fisheries Water Number*	A5
2	YEAR	S
3	DATE *Date of environmental/management event*	D
4	EVENT *Three letter code for lake history event*	A3
5	COMMENT	A75
6	AGENCY *Agency responsible for management intervention*	A5

TYPE = (A)lphanumeric/Character, (D)ate, (S)hort Integer

Table 3-3. List of the 46 lake management and environmental event codes currently used in database table **LAKEHIST**.

Management Event Code	Description
AER	Aeration applied to lake
ANT	Antimycin (Fish Toxicant) application
AQU	Aquathol (Herbicide) application
BAP	Bank Pole fishing
BFS	Boat Fishing Season
BRP	Brushpiles Added to Lake
BWF	Bow Fishing Permitted
CFK	Chemical Fish Kill
CLS	Closed Season to Fishing
CMF	Commercial Fishing
COA	Fish Consumption Advisories
CTR	Catch and Release Fishing Only
CUS	COPPER SULFATE Application
CUT	CUTRINE (Herbicide) Application
DIQ	DIQUAT (Herbicide) Application
DIS	Fish Kill Due to Disease
DRG	Dredging
ELM	Electric Motor Only
FCR	Fish Crib
FIN	FINTROL (Fish toxicant) Application
FRT	Lake Fertilization
HLP	Horse Power Limit
JUG	Jugline Fishing
KOM	KOMEEN (Herbicide) Application
KOP	KOPLEX (Herbicide) Application
MTR	Macrophyte Transfer
MWC	Mechanical Weed Cutter
NOF	No Fishing
NOW	No Wake
OPS	Open Fishing Season
OTH	Other
REH	Rehabilitation
RIR	Riprap Application
RON	ROUNDUP (Herbicide) Application
ROT	ROTENONE (Fish toxicant) Application
SMK	Summer Fish Kill
SON	SONAR (Herbicide) Application
SPL	Boat Speed Limit
TDK	Fish Kill Due to Thermal Discharge
TPL	Two Pole and Line Fishing Limit
TRE	Tree Reef Added
TRL	Trotline Fishing
TRR	Tire Reef Added
WLM	Water Level Manipulation
WTK	Winter Fish Kill
XMS	Christmas Trees Added

Table 3-4. The structure of the Paradox data table for historic and current statewide and site-specific fishing regulations, **LAKEREGS**. Each record describes a specific regulation for a specific year and site (either the entire state or a specific water body).

Field #	Field Name Field Description	Type / Length
1	WATERNUM *IDNR-Fisheries Water Number*	A5
2	YEAR	S
3	FASSP *IDNR three letter fish species/group code*	A3
4	LIMITCODE *Code for type of Regulation*	A3
5	#FISH<A *Daily catch limit or limit below size A for slot limits*	S
6	SLIMIT-A *Maximum length limit or lower length of slot in inches*	S
7	#FISH-SLOT *Daily total catch limit for the slot*	S
8	SLIMIT-B *Minimum length limit or upper length of slot in inches*	S
9	#FISH>B *Daily catch limit for fish above size B*	S
10	COMMENTS	A75

TYPE = (A)lphanumeric/Character, (S)hort Integer

Table 3-5. Codes for fishing regulations used in table **LAKEREGS**.

LIMITCODE	Description of regulation
A	Aggregate Limit
C	Creel Limit
CA	Creel/aggregate Limit
M	Minimum Length Limit
MA	Minimum/Aggregate Limit
MC	Minimum/Creel Limit
MCA	Minimum/Creel/Aggregate Limit
P	Pole and Line Only
S	Slot Limit
SA	Slot/Aggregate Limit
SC	Slot/Creel Limit
SCA	Slot/Creel/Aggregate Limit
X	Closed Season

Table 3-6. The structure of the Paradox data table for fish stocking records, **STOCK**. Adapted from the IDNR-Fisheries hatcheries database table of the same name. **STOCK** includes an additional field to characterize fish stock or genotype and is modified to relate to FAS-LAKES tables. Each record represents a single species stocking event.

Field #	Field Name Field Description	Type / Length
1	WATERNUM *IDNR-Fisheries Water Number*	A5
2	YEAR	S
3	DATESTOCKED *Date of fish stocking*	D
4	FASSP *IDNR three letter fish species/group code*	A3
5	SIZE *Size (in inches) of fish stocked*	N
6	QTYSTOCKED *Number of fish stocked*	N
7	GENOTYPE *Genotype or stock of fish species*	A10
8	REARAREA *IDNR-Fisheries Water Number of rearing site of stocked fish*	A5
9	STOCKTYPE *Three letter code characterizing the stocking event*	A3
10	FISHPERACRE *Number of fish stocked per acre*	N
11	HATCHERY *IDNR-Fisheries Water Number of hatchery origin of stocked fish*	A5
12	COMMENTS	A144

TYPE = (A)lphanumeric/Character, (D)ate, (N)umeric, (S)hort integer

Table 3-7. Data analyses approach to management practices in Illinois lakes (r-m AOV=repeated-measures analysis of variance).

Data Pattern	Proposed Test	First Factor	Second Factor	Third Factor
No replicate Single management event	Superposed epoch analysis; t-test	Before/After	none	none
No replicate Multiple management events of same kind	One-way r-m AOV	Intervals between interventions	none	none
>1 replicate Single management event	2-way r-m AOV	Before/After	Lakes	none
>1 replicate Multiple management events of same kind	2-way r-m AOV	Intervals between interventions	Lakes	none
No replicate Multiple management events of different kind	2-way r-m AOV	Before/After	Management kind	none
>1 replicate Multiple management events of different kind	3-way r-m AOV	Before/After	Management kind	Lakes

Job 101.4. Management Optimization

We take broad and specific treatments of this complex but vital challenge to fisheries management. The broad treatment (Section 1) develops a model based on costs and benefits that includes all categories associated with fisheries management, including evaluation. Allocation of investment among species is related to the measured relative importance among anglers and the degree to which there is room for desired improvement. This process is meant as a guide to avoid large distortions in budgeting and make the process more democratic within the bounds of ecological and fiscal realities.

The use of fishery information based on sampling is subject to risk, while census information is either impossible or far too costly compared with the benefits. Therefore, the costs of making wrong decisions, whether it be assuming wrongly that a real change had not occurred, or assuming wrongly that an apparent change had occurred, need to be evaluated. The framework for incorporating these costs is provided.

The specific treatment (Section 2) we address concerns the cost of resource evaluation through population surveys using the boat electrofisher and the associated risks. We estimate the errors associated with detecting or not detecting changes in catch per unit effort of 'quality sized' largemouth bass, bluegill, and gizzard shad among 27 lakes with time-series of 4-10 years. The results permit estimates of the amount of sampling investment needed to detect given trends with given uncertainties, and how to distribute this investment in surveys among lakes. Because electrofishing surveys comprise a significant portion of total management costs, they are an essential component of the general model.

4.1. A management investment model

4.1.1 Cost of investment in fisheries management

The total annual cost, C_t, in dollars (say 1995 dollars) of management per District should include equipment costs corrected for usual discount rates, running and maintenance costs of office and field activities, salaries, wages and overheads, costs of higher levels of management prorated for that District, prorated costs of hatchery service and direct costs of stocking, and prorated costs of internal and external contracts including Sport Fish Restoration funds.

Note that these costs include the costs of evaluation of the results of management decisions and other environmental phenomena. The traditional, compartmentalized view that research should be followed by a management process, which is then evaluated, is not tenable. In the widely accepted 'adaptive management' paradigm, initial data are used to formulate management actions, which are then maintained and monitored, but the accumulated data are then used for modifying management, preferably with experimental controls, which are then evaluated for further refinement. Therefore, research, management, and monitoring occur concurrently and cooperatively, but not on all lakes all of the time. Therefore, total management costs should include all components, and subdivisions of these costs should be governed by the relative efficiency and risk minimization of alternative procedures, and finally their allocation among management sections, funding sources, and agencies.

There are general items that should be discounted from the total budgeted management cost because they cannot be subdivided into different species groups and lakes. Examples are manager's time allocated to dealing with the public, stream work, and responding to routine office tasks and general meetings.

$$\therefore \text{Total cost } (C_t) = \text{General costs } (C_g) + \text{allocated costs } (C_s)$$

where C_s is allocated according to the work that can be identified with particular species and lakes.

Population monitoring, such as standardized boat-electrofishing surveys and standard creel surveys, should not be entirely discounted as C_g because such techniques are more efficient at monitoring some species than others. For example, given an estimate of management cost allocated to a lake (or group of similar lakes) for largemouth bass, how should this recommended investment be divided into direct population monitoring, creel surveys, and other costs over a given time period? Such monitoring costs may dominate the budget unless fish stocking is significant. Therefore, the relative contributions of creel surveys and population surveys to the knowledge of different taxa that is required to improve angler satisfaction should be estimated, even if initial estimates are rather approximate. This is discussed in Section 4.1.3. First, the allocation of costs, C_s, among different fisheries components is developed.

4.1.2 Allocation of costs

The 'allocated cost' of investment in fisheries management (C_s) should be divided proportionally among the fishery components according to their 'room for desired improvement' (R), with each component weighted by the proportion of angler time (A) spent on that component.

$$\therefore \text{ for a component, I:} \qquad C_I = kR_IA_I \quad \ldots\ldots\ldots\ldots \quad (1)$$

'Room for desired improvement', R, is the difference between a realistic goal and the current state, both being related to angler satisfaction. The goal should be ecologically and economically attainable, and can be periodically revised. Because R should be related to long-term angler satisfaction, and because average 'Angler Success (or Satisfaction) Ratings' (ASR) are strongly related to biologically meaningful parameters such as mean size or quantity harvested (Sobaski et al. 1995) of a given species or species group, R can be based on ASR.

$$\therefore R_I = ASR_{g,I} - ASR_I \text{, for component i} \quad \ldots\ldots \quad (2),$$

where

$ASR_{g,i}$ is the angler success rating goal for component i and

ASR_i is the current average angler success rating

A goal for ASR can be initially defined as the highest value among a set of similar lakes in one or more management jurisdictions. It may be adjusted downward in lakes where ecological conditions, such as measures of productivity of desirably sized fish, are more limiting. However, we suspect that, on average, anglers adjust their ratings according to their expectations on each lake. This can be tested. Detailed discussion on R continues below.

'A_i' in (1) can be derived from the annual angler-hours devoted to the component in question, with the effort corresponding to non-specific responses ('I am not fishing for any particular species') being allocated in proportion.

Equation (1) can be summed over all components in a given lake:

$$C = \sum kR_IA_I = k\sum R_IA_I \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where C is the total management cost for all components that can be attributed to different species groups.

Eq. (3) can and should be totaled across all lakes in a manager's district or larger jurisdiction. Subscripts for lakes are omitted for clarity. Data should be totaled in such a manner that the different numbers of anglers that lakes attract are accounted for. This can be achieved by expressing proportion A_i as the number of angler-hours associated with a given component and lake divided by the total number of angler-hours across all lakes. Therefore the subscript 'i' would correspond to a given component-lake combination. (Note that the constant of proportionality, k, is constant across components in (3) which indicates that no bias exists in allocation of management resources among components after accounting for desired improvement, R_i, and angler involvement, A_i.)

Eq. (3) can be simplified by considering total investment in management as 100 units, so that each summed term on the right-hand side of (3) represents the percentage of allocated investment, C_s, that corresponds to each component:

$$C_{100} = 100 = 100k\sum R_i A_i / C_s \quad \ldots\ldots\ldots\ldots \quad (4)$$

Example 1:

To illustrate the management investment model above, the hypothetical example of a single lake with two components, largemouth bass (LMB; i=1) and panfish (i=2), is considered first. During five years, we compute or estimate the following mean values from FAS:

$ASR_1 = 6.2$ $\qquad$ $ASR_2 = 4.3$

$ASR_{g,1} = 8.0$ $\qquad$ $ASR_{g,2} = 7.5$

The $ASR_{g,i}$ values could be based on the maximum averages recorded for ecologically similar lakes, using the ASR values from anglers fishing for the appropriate species group. Although angler ratings are 1 through 10, 10 is an extreme individual value reported on exceptionally rewarding days. The choice of 10 as a goal would involve increasingly large and probably futile investments trying to elicit the top 1 or 2 points in ASR.

Total angler-hours over five years was estimated at 735, of which 74 (10%) fished for LMB, 419 (57%) for panfish, and 242 (33%) for any species. Prorating for the joint category produces:

$A_1 = 0.15$ $\qquad$ $A_2 = 0.85$

Therefore, using (2) and (3):

$$kR_1A_1 = k(ASR_{g,1} - ASR_1)A_1 = 0.33k$$

$$kR_2A_2 = k(ASR_{g,2} - ASR_2)A_2 = 2.72k$$

and $$C_s = kR_1A_1 + kR_2A_2 = 3.05k$$

Using (4), this implies that 11% and 89% of management costs (C_s) should be invested long-term improvement of largemouth bass and panfish fishing, respectively. Of course, some management costs will be allocated simultaneously to both species, such as through boat-electrofishing surveys. The interpretation and practical issues of measurement of management costs will be addressed below.

Example 2:

We now expand the scope of management to include an additional, larger lake, Lake 2, which has three components: largemouth bass (i=3), panfish (i=4), and channel catfish (i=5). Note that components, i, refer to different species/group-lake combinations. The following shows realistic ASR data in addition to those of Lake 1 from Example 1 over five years:

$ASR_3 = 5.2$ $ASR_4 = 7.1$ $ASR_5 = 6.5$

$ASR_{g,3} = 7.5$ $ASR_{g,4} = 7.5$ $ASR_{g,5} = 8.0$

(note that the $ASR_{g,i}$ values do not have to be the same for corresponding species groups if it is estimated that realistic goals for the two lakes should be different. Creel data on maximum annual ASRs among similar lakes should be the main guide).

Total angler-hours over five years was estimated at 1807, of which 271 (15%) fished for LMB, 813 (45%) for panfish, 199 (11%) for catfish (CCF), and 524 (29%) for any species. Prorating for the joint categories in Lakes 1 and 2, and expressing as a proportion of the total angling effort across the two lakes produces:

$A_1 = 0.0434$ $A_2 = 0.246$

$A_3 = 0.153$ $A_4 = 0.459$ $A_5 = 0.099$

Combining, using (3) and (2) as before:

$$kR_1A_1 = k(ASR_{g,1} - ASR_1)A_1 = 0.078k$$
$$kR_2A_2 = k(ASR_{g,2} - ASR_2)A_2 = 0.787k$$
$$kR_3A_3 = k(ASR_{g,3} - ASR_3)A_3 = 0.352k$$
$$kR_4A_4 = k(ASR_{g,4} - ASR_4)A_4 = 0.184k$$
$$kR_5A_5 = k(ASR_{g,5} - ASR_5)A_5 = 0.148k$$

and $$C_s = k\sum R_iA_i = 1.549k$$

Using (4), this implies that the following percentages of the allocated management budget (C_s) could be appropriately invested as follows:

	LMB	Panfish	CCF	Total % by lake
Lake 1	5.0	50.8	-	56
Lake 2	22.7	11.6	9.6	44
Total % by taxa:	27.7	62.7	9.6	

Therefore, appropriate proportions of the total available budget for management (C_t) can be divided among lakes and taxa after general management costs (C_g) not attributable to particular species are deducted. Note, for example, that although Lake 2 has more fishing effort, the lower 'room for improvement' estimate associated with the most popular group, panfish, results in a lower overall investment for that lake. Conversely, the higher angler involvement and slightly higher R-estimate for LMB results in about four times the investment in Lake 2 than Lake 1 for that species.

This accounting method is meant as a guide to avoid large distortions in budgeting. When information from some lakes can be useful for making inferences on others, some costs can be more efficiently concentrated on key lakes while maintaining the proportions by taxa, as explained below.

4.1.3 Allocation of management costs among sampling techniques

Given an allocation (kR_iA_i) from the management budget for a given species group, how do we most efficiently apply this money to manage and monitor this group? We start with a simple example of a species, largemouth bass, in a set of lakes that do not incur stocking costs.

Therefore most of the variable costs will be incurred through monitoring of the fish population (standardized boat electrofishing) and the fishery (creel surveys).

This procedure is not intended to entirely eliminate one approach, because each provides unique information. Boat-electrofishing, and other direct sampling techniques, provide estimates of prerecruits that can only be estimated from creels through anglers' recollections when they return small fish. Only creel surveys can provide harvest and catch, and a variety of information that reflects effectiveness of regulations and angler success ratings (ASR). However, data from either approach can be used to estimate indices of abundance of the exploited stocks through catch-per-unit-effort (CPUE), and this important measure requires more sampling than that required to obtain fish condition indices and stock structure indices. Therefore, the relative cost-effectiveness of creel surveys and population surveys needs to be estimated, so that an appropriate expenditure on each approach for a given set of lakes can be estimated.

First, we need to make some starting assumptions regarding the relative benefits and costs of correct and incorrect decisions. These may be altered with the benefit of more information later. Consider a largemouth bass fishery that has received a regulation change designed to increase the biomass of quality-sized fish (>12 in. long). We may consider it a successful regulation if this biomass had increased by 10% or more during five years, and would probably continue with that regulation, incurring a similar benefit in the future. The minimum benefit can be estimated from the predicted (or measured from past data) increase in angler catch of bass >12 in. during 5 years.

There are two types of wrong decision possible: (Type I) if $P < \alpha$, implying a significant trend that does not exist, and (Type II) when $P > \alpha$, meaning that the null hypothesis is not rejected, but that a trend of a given effect size (here 10%) does exist. The probabilities of the two types of error (α,ß) and of correct decisions ($1-\alpha$,1-ß) are shown below.

Decision from test (P-value compared to α):

True situation	H_o not rejected	H_o rejected
Stock size has not increased (null hypothesis, H_o, is true)	1-α (correct)	α (incorrect)
Stock size did increase by more than x%	ß (incorrect)	1-ß (correct)

Type II error (ß) depends on the "effect size" (here, x%), number of samples (n), variability of the response (variance of CPUE), and the α -value chosen. If we increase the effect size, say from a biomass change of 10% to 20%, we reduce ß, because it is easier to detect a greater change. By increasing n, by investing in more samples, or decreasing variance, by increasing the size of our samples or improving the monitoring design, we will decrease ß. Increasing α, which means we increase the risk that we will incorrectly imply a trend that does not exist, will decrease ß. A common convention is to set $\alpha = 0.05$ and $ß = 0.2$, which means that we are four times more likely to incur the second error as the first. If the benefits of correctly predicting the stock trend are similar, and we wanted the financial risk of making either wrong decision to be equal (FR_α=$FR_ß$), then the actual cost of making Type I error (C_α) would have to be four times the cost of making error II ($C_ß$), because:

$$\text{Financial Risk of Type I error} = FR_\alpha = \alpha C_\alpha$$

$$\text{Financial Risk of Type II error} = FR_ß = ßC_ß$$

Therefore, to spread the financial risk evenly:

$$\mathbf{Fr_\alpha = Fr_ß}, \quad \therefore \ldots\ldots\ldots\ldots\ldots\ldots \alpha C_\alpha = ßC_ß \qquad (5)$$

We develop a qualitative argument below that the two costs, C_α and $C_ß$, are closer to being similar than C_α being four times greater than $C_ß$.

If the manager incorrectly assumes that the stock size has not increased because his 1-tailed P estimate is greater than α, he may change the regulation, such as increase minimum size, in an attempt to get a positive change. He has unknowingly committed error Type II, the cost of

which could be estimated from the loss of fish harvested that resulted from an overly restrictive regulation during, say, the next 5 years.

Conversely, if the manager incorrectly assumes that the stock size has increased because his 1-tailed P estimate is less than α, he may maintain the regulation thinking that it has improved the fishery. He has unknowingly committed error Type I, the cost of which could be estimated from the loss of unharvested fish that could have resulted from an improved regulation during a similar time period.

Although there is an additional public cost of enacting legislation beyond the manager's domain, which would in this case increase C_β relative to C_α, we consider that the dominating costs would be incurred by the hundreds of anglers affected by either wrong decision, which we assume to be roughly similar as a first approximation. Therefore, if $C_\alpha = C_\beta$, we should make α equal to β (5). If the cost of regulation enactment was significant, α should exceed β by an amount predicted by (5), which is the opposite ratio of using the conventional values of 0.05 and 0.20, respectively.

Financial risk, FR, is a real long-term cost that reflects the effectiveness of the current management strategy. If, say, $\alpha = 0.1$, the Type I error would occur, on average, every one in ten years, incurring a cost of C_α. Therefore, averaged over future years, FR_α would be the cost of Type I error. Similarly, FR_β would be the average cost of Type II error. Since they are mutually exclusive, and the risk is spread evenly (5), the long-term average for either risk would be FR ($=FR_\alpha=FR_\beta$).

Obviously we want to make α and β, as small as possible, but this also incurs a monitoring cost (C_m) incurred from taking increasing numbers or sizes of samples. This is where we can make a comparison of costs from the largemouth bass example introduced above, using different sampling designs and calculating α and β values for a realistic problem. Because we want to equalize financial risk, we can adjust α and β (β is decreased by increasing α) and calculate financial risk (FR) from (5).

Note that ß values are reduced by increasing effect size, so why not choose large effect sizes, such as increase the 10% trend to a 20% detectable level? This can be done, but increasing the effect size will increase the cost of not detecting such a larger change ($C_ß$), so the financial risk may or may not change. In Section 2, we analyze the cost in terms of sampling hours required to detect given trends at given α and ß values. This monitoring cost needs to be combined with risk and other costs, as described in the following section.

4.1.4 Minimizing Costs to maximize Benefit-Cost

Total management costs, C_i, available for a given component, i, were derived above from the fraction of monies available ($C_t - C_g = C_s$) determined by the $k\sum R_i A_i$ estimate. This is conveniently divided into costs for monitoring ($C_{m,i}$) explained above, and other costs ($C_{o,i}$) that should be attributed to that taxa, such as stocking, hatchery, targeted analyses and research:

$$C_i = C_{m,i} + C_{o,i} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

An additional cost associated with either types of error, financial risk (FR_i), is not explicit regarding initial investments but is a real cost over time that needs to be optimized with $C_{m,i}$. Therefore, total cost per component is

$$C_{t,i} = FR_i + C_i = FR_i + C_{m,i} + C_{o,i} \quad \ldots\ldots \quad (7).$$

$C_{t,i}$ needs to be minimized and be less than benefits, B_i.

If $C_{o,i}$ is independent or minimal, $C_{t,i}$ will be governed by the inverse relationship between FR_i and $C_{m,i}$. As we increase investment in sampling, $C_{m,i}$ will increase and subsequently the risk of errors, FR_i, will decrease. The sum of these two will not only vary according to the different risk levels (α and ß) utilized, but also to different combinations of direct fish sampling and creel surveys. Such calculations should be done across similar lakes whenever possible, so that the most efficient allocation of monitoring activity can be designed. For example, one standard creel alternately among three comparable lakes may make more sense than one-third of a creel on each lake every year.

Other costs included in $C_{o,i}$, such as stocking, will be an important and possibly dominant variable in some species. Therefore, this variable would influence FR_i in addition to

monitoring, as well as increase total costs. Estimates of the costs and risks for some common stocked species can be derived from the literature as first approximations and incorporated into (7).

It is important to reserve a portion of the costs, and therefore justification, of creel surveys and fish population surveys that are unique and essential. If these proportions are significant, then an additional optimization process needs to be included.

4.1.5 Discussion: temporal and spatial scales

The scales over which the management investment model is utilized are critical. A short time scale, say one year, is unacceptable because of the delays due to ecological and management responses and the greater imprecision of data over a short time period. The real danger of a short-time period is that unattainable goals that were influenced by non-equilibrium conditions or results that cannot be reliably monitored will result in misdirected management resources that will emphasize short-term solutions. An additional danger is that the process of depending on accurate short-term accounting will place an unacceptable burden on precious man-hours of employees. We suggest a five-year period for estimating costs and other variables in the model, which is more than the expected response time for fish populations and fishermen to changes in management and at least to some unmanaged environmental changes.

The spatial scale already implied is that of the District. However, the FAS database provides the opportunity for assessing at the Regional or Statewide scales. More powerful inferences among lake sets will be possible at larger scales, and some accounting procedures will be easier.

4.1.6 Discussion: benefit considerations

Costs are relatively easy to evaluate with sufficient accuracy in the subdivisions proposed. The management investment model allocates management needs to a total budget according to the estimated relative needs, kR_iA_i, for each component. Needs are based on projected benefits. Therefore, benefits in dollar terms, B_i, can be estimated from $kR_{t,i}A_{t,i}$, where $R_{t,i}$ is the subsequent increase in ASR, and $A_{t,i}$ is the subsequent increase in angler effort during a future evaluation time period, t. The constant k relates a dollar cost value to an 'angler' value, without specifying the dollar-value of catching a given quantity, size, and species in a given time. Estimates are available in the literature. These should be refined, but can only be done through

carefully designed surveys of anglers.

It is important to recognize that the best measures for most species of angler satisfaction within lakes is angler catch or harvest per effort in terms of weight of fish above a certain size per angler-hour, or by using annual ASR itself. The choice between catch and harvest can be determined by choosing which is the consistently best predictor of annual ASR. Similarly, the choice between total angler effort, or angler effort devoted to the taxa of interest can be made. ASR itself may be an appropriate measure across species within lakes, but may not be sufficiently comparable across lakes.

4.1.7 Conclusions

All relevant costs within a clearly defined spatial and temporal domain must be assembled before assessment and interpolation. Many costs and benefits are not obtainable with high precision, but the low precision in an individual variable may not be critical in the model when it plays a minor part. Outlining the scope of the model and doing trial calculations are important steps in deciding how to divide the model into workable subsets, that involve the definition of managed taxa, lake-sets, jurisdictional bounds (Districts, Regions or statewide), and time periods for evaluation.

4.2. An analysis of investment required in electrofishing surveys

Significant costs in terms of personnel, travel, accommodation, and equipment are involved in the necessary evaluation of fish stocks. There never seem to be sufficient resources to obtain enough samples for all the lakes and species that need management, yet we do not have the most approximate idea of what is the 'best' investment strategy to evaluate the resource itself.

Population surveys using the boat electrofisher is not the only management cost, but it is one of the most significant and is therefore chosen as an example that should eventually be used as a component in the management investment model. The 'room for desired improvement', R (Section 1), may be a biologically plausible increase in the biomass of a quality-sized species. Therefore, we need to have the capacity to detect a minimum increase over a reasonable time period between say 4-6 years, of an acceptable indicator of the density of that biomass, e.g., catch per unit effort as weight of quality sized fish caught per hour of standardized electrofishing. The cost of attempting to evaluate to what extent the goal, R, has been achieved needs to be increased by the probable costs of incorrect interpretation of the results. To decrease the cost of incorrect interpretation we need to increase the cost of sampling, so the total cost should have a minimum, optimum value. Therefore, the particular values of CPUE trend, α, and ß that we have chosen to illustrate the sampling investment required will not necessarily be the optimum values when the costs of the two types of error are incorporated.

Here, we estimate the amount of sampling investment needed, as hours of electrofishing, to detect a CPUE trend of 20% per year with given uncertainties of α=0.1 and ß=0.1 (power=0.9), for 'quality sized' largemouth bass, bluegill, and gizzard shad populations. We have included the non-sportfish, gizzard shad, because it represents a contrast in behavior (large, pelagic schools) that may affect sampling variance, and because it is frequently managed to provide forage for coolwater sportfish. We determine what other factors may influence the sampling cost and how to distribute this investment in surveys among lakes.

4.2.1 Methods

The FAS database was used to select 27 lakes with fully documented time-series of fall electrofishing samples over 4-10 years. All lakes contained quality-sized largemouth bass (LMB, >30 cm TL) and bluegill (BLG, >15 cm TL) while 18 contained quality-sized gizzard shad (GZS, >28 cm TL). The lakes (Table 4.1) ranged in size from 12 - 18,900 acres, and included a range of types including those with fixed-level dams, flood control, and power generation facilities.

The effect size of interest was the trend, in terms of proportional change in CPUE, as weight in kg of quality-sized fish caught per hour of electrofishing. Duration of individual samples varied among lakes between 30 and 180-min (mostly 60-min), with individual lakes having a constant or low variability of sample duration. Therefore, individual lakes were analyzed separately in terms of numbers of samples required for given errors, but compared on the basis of total hours of sampling required per year.

The regression model used was $\ln(CPUE) = a + bt$, where a is the intercept, b the slope, and t time in years. CPUE was positively skewed, as is typical for this measurement, so the log-transformation tended to normalize and stabilize the residual variance. This transformation also permitted the parameterization of a trend in terms of a percentage change per year. Rearranging and differentiating the regression model formula produces:

$$\frac{1}{CPUE} \times \frac{d(CPUE)}{dt} = b,$$

which says that the slope, b, is the instantaneous change of CPUE compared to its current value, per unit time. It is easier to conceive of a discrete change, such as 0.2 (20%) per year, as the effect size. This would be equivalent to using an effect size for the slope b of 0.182 /yr, which is what was used in this analysis. Considering that the increase in this model is accumulative (CPUE accelerates, or decelerates, over time) large annual rates cannot be sustained. Therefore, the effect size chosen should be limited by a realistic carrying capacity estimate near the end of the chosen time period.

To determine number of samples required, power analysis requires effect size (here b=0.182), Type I error α (here 0.1) and Type I error ß (here 0.1, i.e., power=0.9), and the standard

deviation (√variance). The SYSTAT model, DESIGN, was used for power calculations, using the PAIRED command to enter the effect size and compare a single sample to a known standard (zero slope). In this case, the standard deviation needs to be the standard deviation of a population of possible slopes. The regression equation uses Sb, the standard error of the slope, using a 2-tailed t-test to compare the estimated slope, b, with zero. Therefore Sb depends on the number of samples used. A standard deviation of the slope was estimated using the central limit theorem, by multiplying Sb by the square root of the number of samples used in the regression. Therefore, the purpose of the regression analysis by lake and species was to obtain estimates of the standard deviation of the slope, whether or not the slope was significant. Therefore, the immediate purpose of this analysis was to determine how consistent this slope variation was among lakes, because this variation determined differences among the predicted number of samples required for each lake and species.

Because sample size, in terms of duration of electrofishing, varied among lakes, results for comparison were expressed in terms of total hours of electrofishing sampling required for consistent power of detection. This necessary correction results in minimal statistical bias compared to other sources of error in the optimization process. Another statistical bias considered to be minor was that different lakes had different numbers of replicates within years. A potentially more serious error is spatial and temporal autocorrelation within lakes. After arranging data spatially within years, and temporally from year-to-year, autocorrelations of ln(CPUE) at $P<0.05$ were observed in 17 out of 72 lake-species combinations. This compares with an expected 4 apparent correlations due to random effects. Therefore, although autocorrelation was less serious than expected, results of expected numbers of samples at the stated error levels will somewhat underestimate true values.

4.2.2 Results

The estimated hours of annual fall electrofishing to detect a ±20% per year change in CPUE with a 10% risk of wrongly assuming a trend when none existed (α) and a 10% risk of failure to detect such a trend (ß) are plotted for each lake in Figure 4.1 by species. Two factors were significant in describing variation in this variable, as expressed on a logarithmic scale.

The range of years used was most significant, with more years requiring less annual sampling with all species. This is not surprising, because the range of a predictor variable is as important

as the residual variance in determining the error of a regression slope.

The second factor was ln(CPUE), with higher mean values resulting in higher slope variance, requiring more sampling. This was a significant effect with BLG and GZS, but not with LMB that has a much smaller range in CPUE values. This general dependency implies that the log-transformation of CPUE was insufficient, but alternative transformations would result in difficulty interpreting the slope as an effect size. Therefore, some estimate of expected mean CPUE is needed to refine the estimate.

No effect of lake size (as area or $\sqrt{}$(area) as a proxy of perimeter length) could be detected, despite the large size range of lakes. This may seem counterintuitive, but statistically the result makes sense, because statistical precision is not a function of the proportion of the maximum number of possible samples that was sampled, but rather the number of samples taken. This result has the advantage that it simplifies the process of dividing sampling effort among lakes.

The foregoing tests resulted in a model (Table 4.2) that can be used to predict hours of sampling required on a given lake under given circumstances. The model can be summarized in the power form, as the following example shows for BLG:

$$\textbf{Hours of sampling per year} = e^{3.31}(\mathrm{YEARS})^{-1.98}(\mathrm{CPUE})^{1.16}$$

The proportion of variance explained was 73%, 37%, and 62% for BLG, LMB, and GZS, respectively. Considering the natural differences among the lakes, the different sampling protocols due to different perceptions and habits among biologists, and the statistical caveats mentioned above, we consider the fits to this model remarkable.

Figure 4.1 shows examples of predictions at CPUEs of 0.5 and 5 kg/h of quality-sized fish. As an example, if predicted CPUE was 5 kg/h for each species, and a trend of 20% was to be tested after 6 years of measurements, about 6, 4.5 and 5.5 hours/year would be required for BLG, LMB, and GZS, respectively. Therefore, about 6 hours should be sufficient for any of these species unless CPUE exceeded 5 kg/h. In practice, typical CPUE by weight is larger for LMB than the other species in this large set of lakes (Fig4.1), so predictions based on that species would often be sufficient for detecting trends in the other species.

4.2.3 Discussion

The reader is reminded that the power estimates were 2-tailed, meaning that the ability to detect an increase ≥20% or a decrease ≤-20% was estimated. We suggest that the ability to detect a decline in a population is also important and should be figured as a negative benefit or additional cost. Otherwise, a 1-tailed test should be devised if a decline does not produce a significant reduction in benefits.

We repeat that the effect size and errors chosen here may not be optimal. If cost of sampling is relatively greater than those resulting from interpretation errors, then larger errors may be acceptable. If α- and ß-errors are doubled to 0.2, the quantity of sampling required is roughly halved. Also, if there is a very large estimated room for improvement (R) in a fishery, a greater effect size than 20% per year may be justified which would be less costly to detect. However, a higher rate cannot be maintained over a longer time period (especially in this model in which the absolute CPUE change accelerates over time), and shorter time periods demand greater sampling effort (Figure 4.1). Considering the logarithmic scale in Figure 4.1, it should be apparent that detecting reasonable changes from one year to the next would be prohibitively costly and probably not very meaningful for the longer term if it were detected.

The lack of effect of lake size may not only be due to the statistical effect noted above. Population dynamic effects may be responsible for high variance of population indicators being maintained on smaller lakes. Preliminary creel analyses suggest that coefficient of variation of CPUE and harvest is larger on smaller lakes. We suspect that this interannual variation is partly due to single populations that are subject to wide swings in recruitment and survival, whereas large lakes probably contain several stocks that do not always vary in unison. Whatever the reason, projected hours of sampling under reasonable effect sizes and errors (Figure 4.1) exceed the time taken by a single electrofishing run on the smaller lakes. This does not invalidate the model, because a complete circuit of the lake is not a census, but a sample taking a variable fraction of the fish. A second sample taken a week later will not produce the same result. The problem may be soluble by replicating samples each fall, with a sufficient period between samples to minimize autocorrelation. Although this is temporal variation within the season, this variation affects the precision of trend detection over several years when only one sampling trip per year is made. An alternative would be to consider the feasibility of using larger effect sizes on the basis that relative annual changes in small lakes are probably greater

than on large lakes. The trade-off would be that trends may not be sustained over longer periods, so short periods of 3-4 years may be required. A final alternative may result from risk analysis, in which the costs of making errors on smaller lakes may be smaller relative to the other costs, permitting higher Type I and II errors and thereby reducing the sampling time.

Conversely, a fishery that is considered to be in good shape will have a low R, resulting in such a low effect size that it would be very costly to attempt to detect a change even over a long period of time. Lakes that are dominated by sportfish populations that appear to be near their optima regarding angler satisfaction may be sampled less frequently despite high ASR estimates, as indicated in Section 1.2. Such sampling would not be designed to detect a given trend anticipated from a change in management, but rather to monitor the fishery in case unexpected disturbances occur outside the control of management.

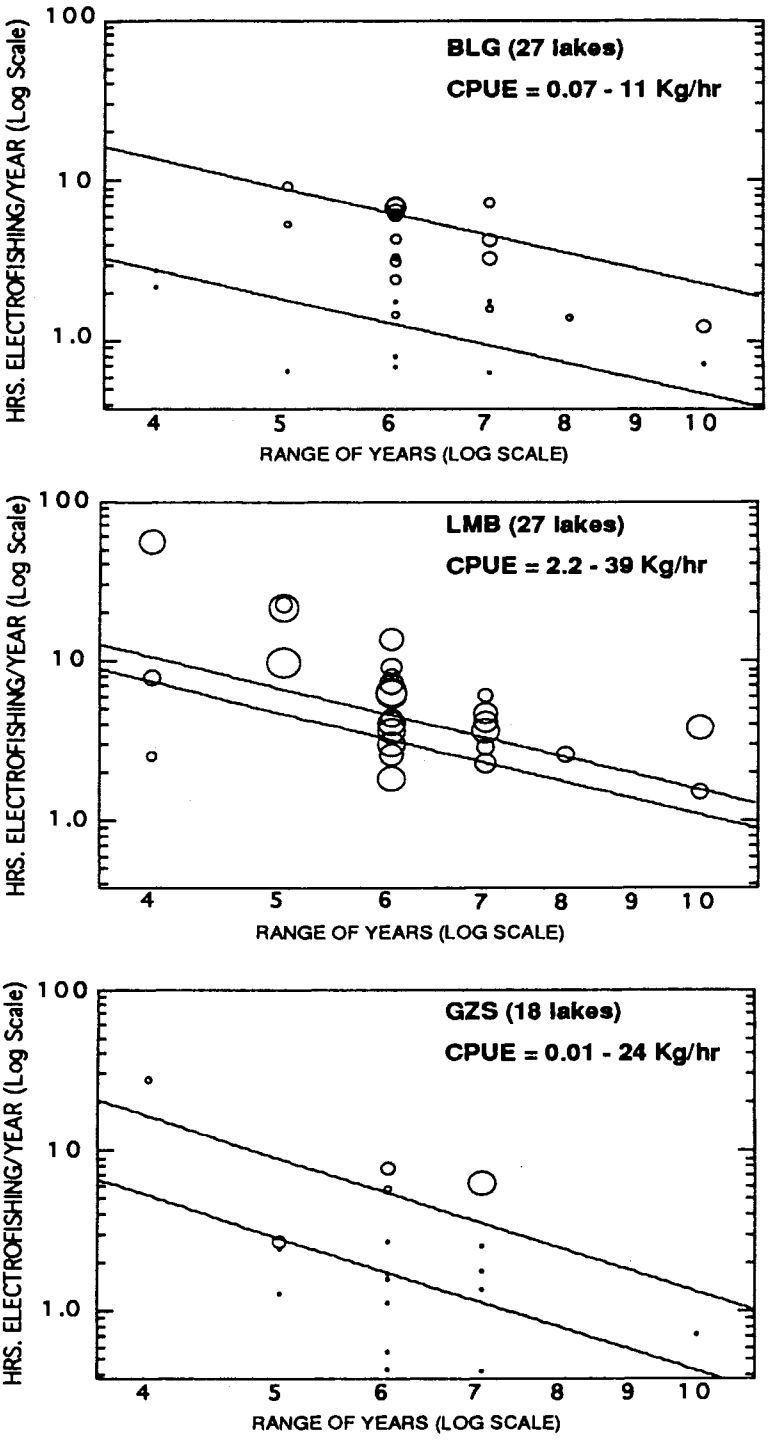

Fig. 4-1. Estimated hours per year of fall electrofishing required to detect a positive or negative trend of 20% per year or more with Type 1 and Type 2 errors of 0.1 (i.e. power = 0.9) for 3 species. Symbol diameters are proportional to mean ln(CPUE) of each lake (range shown). Upper and lower lines represent predicted hours for mean CPUEs of 0.5 and 5 kg/hr, respectively, based on model (see text) that was derived from data shown.

Table 4.1. Lakes used in the power analysis of Catch Per Unit Effort.

Lake	Acreage	Range of Years Sampled First	Last	# Yrs. Sampled	No. of Samples
Beaver Dam Lake	56.6	1985	1991	6	22
Clinton Lake	4895	1985	1991	6	106
Coffeen Lake	1100	1986	1991	5	42
Dawson Lake	158	1984	1991	7	28
Forbes Lake	525	1985	1991	6	30
Heidecke Lake	1955	1984	1991	7	86
Horton Lake	12.6	1984	1991	7	8
Lake Shelbyville	11100	1984	1991	7	84
Lake Atwood	20	1987	1991	4	5
Lake Jacksonville	476	1987	1991	4	10
Lake Sara	586	1985	1991	6	8
Lake Sangchris	2165	1984	1991	7	28
Lake Springfield	4234	1984	1991	7	24
Lincoln Trail Lake	146	1983	1991	8	27
Mccullom Lake	245	1987	1991	4	5
Mill Creek Lake	811	1981	1991	10	33
Pittsfield Lake	241	1985	1991	6	13
Powerton Lake	1426	1986	1991	5	23
Ramsey Lake	46	1985	1991	6	10
Rend Lake	18900	1985	1991	6	50
Sam Parr Lake	180	1985	1991	6	17
Schuy-Rush Lake	225	1985	1991	6	11
Spring Lake (South)	660	1986	1991	5	12
Walnut Point Lake	59	1981	1991	10	22
Waverly Lake	161	1985	1991	6	7
Weldon Springs Lake	29.4	1985	1991	6	32
Wolf Lake	419	1985	1991	6	21

Table 4.2. Results of fits to three species of model:

ln(Hours electrofishing/yr) = constant + a(ln(CPUE)) + b(ln(range of years)), where 'Hours electrofishing/yr' is the amount of sampling required for Type I and II errors of 0.1 to detect a cumulative annual change in CPUE of ±20%. CPUE is Kg of quality fish per hour.

SPECIES = BLG
DEP VAR: LHR_YR1 N: 27 MULTIPLE R: 0.852 SQUARED MULTIPLE R: 0.725
ADJUSTED SQUARED MULTIPLE R: 0.702 STANDARD ERROR OF ESTIMATE: 0.460

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2-TAIL)
CONSTANT	3.311	0.729	0.000	.	4.541	0.000
LQUALKG	1.160	0.154	0.842	0.911	7.515	0.000
LOGYEAR	-1.980	0.417	-0.532	0.911	-4.746	0.000

SPECIES = LMB
DEP VAR: LHR_YR1 N: 27 MULTIPLE R: 0.607 SQUARED MULTIPLE R: 0.368
ADJUSTED SQUARED MULTIPLE R: 0.315 STANDARD ERROR OF ESTIMATE: 0.699

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2-TAIL)
CONSTANT	4.871	1.235	0.000	.	3.943	0.001
LQUALKG	0.263	0.209	0.204	1.000	1.258	0.221
LOGYEAR	-2.124	0.606	-0.569	1.000	-3.508	0.002

SPECIES = GZS
DEP VAR: LHR_YR1 N: 18 MULTIPLE R: 0.785 SQUARED MULTIPLE R: 0.616
ADJUSTED SQUARED MULTIPLE R: 0.565 STANDARD ERROR OF ESTIMATE: 0.720

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2-TAIL)
CONSTANT	5.187	1.643	0.000	.	3.157	0.007
LQUALKG	0.836	0.215	0.620	1.000	3.878	0.001
LOGYEAR	-2.779	0.901	-0.493	1.000	-3.084	0.008

Appendix A. Results from the 1995 creel surveys, including those conducted under Project IDOC 41309515 (formerly F-29-D), listed in alphabetical order by lake. Each set of lake results includes standard effort, harvest, catch, and partial ancillary output tables. Annual creel results pertain to the standard survey period of March 15 -November 15, except where noted below. Numbers given in parentheses, following the lake name, denote the total years of creel data collected for that lake since 1987.

The impoundments results are listed in the following order:

Argyle Lake (3)

Beaver Dam Lake (4)

Clinton Lake (2) [section 1 closed 10/12/95][section 4 10/10/95 - 3/31/95]

Clinton Tailwater (1)

Jones State Lake (8)

Kinkaid Lake (5)

Monee Reservoir (2) [4/1/95 - 10/31/95]

Newton Lake (1)

Otter Lake (2) [one section closed 10/12/95]

Powerton Lake (2) [2/15/95 - 10/12/95]

Randolph County Lake (1)

Red Hills State Lake (3)

Skokie Lagoons (1) [7/1/95 - 10/31/95]

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=1 LAKE :=ARGYLE LAKE
DISTRICT :=04 YEAR :=95
ACREAGE :92 SAMPLING RATIO :=322/738 = 43.6%
NUMBER OF INTERVIEWS:1732

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	10718	8983-12453	(16%)	117	98-135	(16%)	15.17
WKND/HOL	10601	9306-11896	(12%)	115	101-129	(12%)	32.56
STR TOTAL	21319	19169-23469	(10%)	232	208-255	(10%)	23.82
SHORE FISHING:							
WEEKDAY	7174	5852-8496	(18%)	78	64-92	(18%)	10.63
WKND/HOL	6314	5374-7254	(15%)	69	58-79	(15%)	18.29
STR TOTAL	13488	11881-15095	(12%)	147	129-164	(12%)	14.21
BOAT/SHORE COALESCED:							
WEEKDAY	17791	15676-19986	(12%)	193	170-216	(12%)	13.44
WKND/HOL	16737	14849-18625	(11%)	182	161-202	(11%)	27.52
STR TOTAL	34518	31716-37320	(8%)	375	345-406	(8%)	20.27
BOAT/SHORE STRATIFIED:							
WEEKDAY	17892	15740-20044	(12%)	194	171-218	(12%)	13.35
WKND/HOL	16916	15336-18496	(9%)	184	167-201	(9%)	27.23
STR TOTAL	34808	32150-37466	(8%)	378	349-407	(8%)	20.10

HARVESTED AND CPUE TABLE *** DAY ***

REGION :=1 LAKE :=ARGYLE LAKE
DISTRICT :=04 YEAR :=95
ACREAGE :92 SAMPLING RATIO :=644/1476 = 43.6%
RATIO OF EFFORT HOURS INTERVIEWED := 6995.2/34811.7 = 20.09%
NUMBER OF INTERVIEWS: 1732

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
RSF BRH BLB BGH PUD
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.099	.028-.170	(72 %)	3125	1819-4432	(42 %)	83.94	33.97
BLG	.238	.172-.305	(28 %)	11054	9088-13019	(18 %)	296.88	120.15
CCF	.053	.033-.072	(37 %)	1492	1161-1823	(22 %)	40.07	16.22
GSF	.000	.000-.001	(96 %)	36	3-69	(92 %)	.97	.39
LMB	.021	.006-.036	(71 %)	457	295-620	(36 %)	12.28	4.97
RBT	.091	.063-.119	(31 %)	2840	1794-3885	(37 %)	76.27	30.87
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.022	.004-.041	(83 %)	708	310-1105	(56 %)	19.01	7.69
WSH	.002	.000-.003	(72 %)	100	34-166	(66 %)	2.68	1.08
MSC	.022	+-.045	(103 %)	720	416-1024	(42 %)	19.33	7.82
TOT	.548	.434-.663	(21 %)	20531	17553-23509	(15 %)	551.43	223.16

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.016	.004-.029	(76 %)	510	284-736	(44 %)	13.704	163.2
BLG	.024	.017-.031	(28 %)	1152	946-1359	(18 %)	30.943	104.2
CCF	.024	.016-.033	(35 %)	685	519-851	(24 %)	18.402	459.2
GSF	.000	.000-.000	(94 %)	4	-7	(90 %)	.099	103.0
LMB	.016	.007-.025	(58 %)	337	212-461	(37 %)	9.044	736.7
RBT	.030	.020-.040	(32 %)	870	575-1166	(34 %)	23.375	306.5
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.003	.000-.005	(73 %)	90	40-140	(55 %)	2.416	127.1
WSH	.000	.000-.001	(68 %)	51	21-80	(59 %)	1.357	507.2
MSC	.004	.000-.007	(85 %)	146	82-209	(43 %)	3.909	202.2
TOT	.118	.096-.140	(18 %)	3844	3323-4365	(14 %)	103.249	187.2

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.036	.009-.064	(76 %)	1125	627-1623	(44 %)	12.226	.3599
BLG	.053	.038-.068	(28 %)	2540	2085-2995	(18 %)	27.608	.2298
CCF	.054	.035-.072	(35 %)	1510	1144-1877	(24 %)	16.418	1.0124
GSF	.000	.000-.000	(94 %)	8	-16	(90 %)	.089	.2270
LMB	.034	.014-.054	(58 %)	742	468-1016	(37 %)	8.069	1.6242
RBT	.066	.045-.088	(32 %)	1919	1268-2570	(34 %)	20.855	.6756
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.006	.002-.011	(73 %)	198	89-308	(55 %)	2.155	.2802
WSH	.002	.000-.003	(68 %)	111	46-177	(59 %)	1.211	1.1181
MSC	.009	.001-.016	(85 %)	321	181-460	(43 %)	3.488	.4458
TOT	.260	.213-.308	(18 %)	8475	7326-9624	(14 %)	92.119	.4128

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=1 LAKE :=ARGYLE LAKE
DISTRICT :=04 YEAR :=95
ACREAGE :92 SAMPLING RATIO :=644/1476 = 43.6%
RATIO OF EFFORT HOURS INTERVIEWED := 6995.2/34811.7 = 20.09%
NUMBER OF INTERVIEWS: 1732

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
RSF BRH BLB BGH PUD
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.210	.073-.347	(65 %)	6290	3790-8790	(40 %)	168.93	68.37
BLG	.780	.631-.928	(19 %)	33907	28426-39388	(16 %)	910.68	368.55
CCF	.081	.056-.106	(31 %)	2241	1766-2717	(21 %)	60.20	24.36
GSF	.008	.002-.013	(74 %)	268	121-415	(55 %)	7.20	2.92
LMB	.114	.083-.144	(27 %)	4724	3869-5580	(18 %)	126.89	51.35
RBT	.146	.104-.188	(29 %)	4622	3190-6055	(31 %)	124.15	50.25
TGM	.000	.000-.001	(93 %)	46	-93	(99 %)	1.25	.51
WHC	.067	+-.144	(116 %)	1412	754-2070	(47 %)	37.92	15.35
WSH	.009	.004-.014	(55 %)	424	248-599	(41 %)	11.38	4.61
MSC	.026	.003-.049	(87 %)	824	512-1137	(38 %)	22.14	8.96
TOT	1.441	1.205-1.677	(16 %)	54759	47892-61626	(13 %)	1470.74	595.20

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.025	.007-.043	(72 %)	730	411-1050	(44 %)	19.610	116.1
BLG	.049	.039-.060	(21 %)	2245	1902-2587	(15 %)	60.285	66.2
CCF	.029	.019-.038	(33 %)	812	624-1000	(23 %)	21.801	362.1
GSF	.000	.000-.000	(57 %)	19	8-30	(57 %)	.506	70.2
LMB	.067	.050-.083	(24 %)	2764	2217-3312	(20 %)	74.247	585.1
RBT	.049	.034-.064	(30 %)	1545	1046-2045	(32 %)	41.508	334.3
TGM	.000	+-.000	(106 %)	34	+-71	(112 %)	.906	727.1
WHC	.005	.001-.008	(70 %)	121	64-178	(47 %)	3.244	85.5
WSH	.004	.000-.008	(92 %)	153	66-239	(57 %)	4.098	360.1
MSC	.004	.000-.008	(79 %)	159	95-222	(40 %)	4.259	192.4
TOT	.233	.199-.266	(14 %)	8581	7608-9554	(11 %)	230.464	156.7

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.054	.015-.094	(72 %)	1610	905-2314	(44 %)	17.496	.2559
BLG	.109	.085-.132	(21 %)	4948	4194-5703	(15 %)	53.787	.1459
CCF	.064	.042-.085	(33 %)	1789	1375-2204	(23 %)	19.451	.7984
GSF	.001	.000-.002	(57 %)	41	18-65	(57 %)	.451	.1547
LMB	.147	.111-.182	(24 %)	6094	4887-7302	(20 %)	66.243	1.2900
RBT	.109	.076-.142	(30 %)	3407	2307-4508	(32 %)	37.034	.7371
TGM	.001	+-.002	(106 %)	74	+-158	(112 %)	.809	1.6029
WHC	.010	.003-.018	(70 %)	266	140-392	(47 %)	2.894	.1886
WSH	.009	.000-.017	(92 %)	336	146-527	(57 %)	3.656	.7939
MSC	.010	.002-.017	(79 %)	350	209-490	(40 %)	3.799	.4241
TOT	.513	.440-.586	(14 %)	18917	16772-21062	(11 %)	205.620	.3455

TABLE FINAL REPORT FOR ARGYLE LAKE 1995 DAY CREEL
DAYTIME DATA FOR LAKE=ARGYLE LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	3.8	3.6 - 4	(5%)	.3	11.8	402
SHORE	1.9	1.7 - 2.1	(11%)	.4	5.5	81
BOAT & SHORE	3.5	3.3 - 3.6	(5%)	.3	11.8	483

246 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
32% OF ALL 1509 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	41.2	37.7 - 44.6	(8%)	1	900	1503
SUCCESS RATING 1-10?	4.4	4.2 - 4.5	(4%)	1	10	1259

IS CATCH ILLEGAL?
CLERK NOTED 7 OUT OF 1509 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	517	(34.3%)	BLG	186	(12.3%)
RBT	124	(8.2%)	CAT	150	(9.9%)
LMB	358	(23.7%)	WAE	8	(.5%)
CRP	60	(4%)	CCF	25	(1.7%)
BLC	27	(1.8%)	BSS	45	(3%)
WSH	3	(.2%)	SUN	5	(.3%)
TGM	1	(.1%)			

PARTY SIZE VS. # INTERVIEWS

BOAT		SHORE	
1	246	1	199
2	526	2	234
3	117	3	79
4	28	4	38
5	8	5	12
6	8	6	3
7	1	7	3
8	1	8	1
9	2	9	
10+	1	10+	2

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=4 LAKE :=BEAVER DAM LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :56 SAMPLING RATIO :=319/738 = 43.2%
NUMBER OF INTERVIEWS:2447

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	6385	5376-7394	(16%)	114	96-132	(16%)	24.08
WKND/HOL	8027	6905-9149	(14%)	143	123-163	(14%)	53.80
STR TOTAL	14412	12920-15904	(10%)	257	231-284	(10%)	40.63
SHORE FISHING:							
WEEKDAY	8068	6867-9269	(15%)	144	123-166	(15%)	21.12
WKND/HOL	7005	6048-7962	(14%)	125	108-142	(14%)	41.53
STR TOTAL	15073	13557-16589	(10%)	269	242-296	(10%)	30.60
BOAT/SHORE COALESCED:							
WEEKDAY	14183	12482-15884	(12%)	253	223-284	(12%)	22.85
WKND/HOL	14904	13122-16686	(12%)	266	234-298	(12%)	48.50
STR TOTAL	29087	26650-31524	(8%)	519	476-563	(8%)	35.99
BOAT/SHORE STRATIFIED:							
WEEKDAY	14454	12898-16010	(11%)	258	230-286	(11%)	22.43
WKND/HOL	15034	13582-16486	(10%)	268	243-294	(10%)	48.08
STR TOTAL	29488	27373-31603	(7%)	527	489-564	(7%)	35.50

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=BEAVER DAM LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :56 SAMPLING RATIO :=638/1476 = 43.2%
RATIO OF EFFORT HOURS INTERVIEWED := 10469.2/29491.7 = 35.49%
NUMBER OF INTERVIEWS: 2447

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GOS YLB RSF
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.019	+-.060	(213 %)	317	94-540	(70 %)	14.00	5.67
BLG	.167	.096-.237	(42 %)	6046	4583-7509	(24 %)	266.76	107.96
CCF	.039	.025-.053	(35 %)	873	633-1114	(27 %)	38.54	15.60
GSF	.000	+-.000	(103 %)	19	-37	(97 %)	.84	.34
GZS		*** NOT RECORDED ***			*** NOT RECORDED ***			
LMB	.019	.005-.032	(72 %)	381	172-589	(55 %)	16.80	6.80
RBT	.055	.030-.080	(45 %)	2390	1504-3277	(37 %)	105.47	42.69
WHC	.062	.010-.115	(84 %)	1269	702-1836	(45 %)	55.99	22.66
YEB	.001	+-.003	(100 %)	68	+-145	(113 %)	3.00	1.22
MSC	.000	+-.000	(198 %)	3	+-7	(147 %)	.13	.06
TOT	.363	.272-.454	(25 %)	11366	9543-13189	(16 %)	501.53	202.97

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.003	+-.006	(110 %)	71	28-114	(61 %)	3.115	222.5
BLG	.010	.006-.014	(41 %)	388	293-483	(25 %)	17.117	64.2
CCF	.016	.011-.021	(32 %)	366	264-468	(28 %)	16.160	419.3
GSF	.000	+-.000	(107 %)	1	-3	(99 %)	.058	68.9
GZS		*** NOT RECORDED ***			*** NOT RECORDED ***			
LMB	.018	.004-.032	(77 %)	356	173-540	(52 %)	15.725	936.2
RBT	.015	.009-.021	(39 %)	685	430-940	(37 %)	30.221	286.5
WHC	.016	.001-.031	(92 %)	290	143-436	(51 %)	12.784	228.3
YEB	.000	+-.000	(103 %)	14	+-28	(101 %)	.614	204.6
MSC	.000	+-.000	(207 %)		+-1	(161 %)	.019	143.9
TOT	.079	.059-.099	(25 %)	2171	1827-2516	(16 %)	95.814	191.0

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.007	+-.014	(110 %)	156	61-250	(61 %)	2.780	.4905
BLG	.023	.013-.032	(41 %)	855	645-1065	(25 %)	15.271	.1415
CCF	.035	.024-.046	(32 %)	807	583-1032	(28 %)	14.418	.9245
GSF	.000	+-.000	(107 %)	3	-6	(99 %)	.052	.1520
GZS		*** NOT RECORDED ***			*** NOT RECORDED ***			
LMB	.040	.009-.071	(77 %)	786	381-1191	(52 %)	14.030	2.0640
RBT	.034	.020-.047	(39 %)	1510	948-2072	(37 %)	26.964	.6317
WHC	.036	.003-.068	(92 %)	639	316-962	(51 %)	11.406	.5034
YEB	.000	+-.001	(103 %)	31	+-62	(101 %)	.548	.4511
MSC	.000	+-.000	(207 %)		+-2	(161 %)	.017	.3171
TOT	.174	.131-.217	(25 %)	4787	4028-5546	(16 %)	85.485	.4212

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=BEAVER DAM LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :56 SAMPLING RATIO :=638/1476 = 43.2%
RATIO OF EFFORT HOURS INTERVIEWED := 10469.2/29491.7 = 35.49%
NUMBER OF INTERVIEWS: 2447

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GOS YLB RSF
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.040	.005-.075	(87 %)	802	465-1139	(42 %)	35.38	14.32
BLG	.375	.270-.480	(28 %)	14427	11537-17316	(20 %)	636.56	257.62
CCF	.049	.035-.064	(30 %)	1297	997-1598	(23 %)	57.25	23.17
GSF	.005	+-.013	(143 %)	135	58-213	(57 %)	5.97	2.42
GZS	.002	.000-.003	(72 %)	210	+-451	(115 %)	9.26	3.75
LMB	.186	.136-.237	(27 %)	5021	4000-6042	(20 %)	221.54	89.66
RBT	.081	.054-.108	(33 %)	3398	2137-4659	(37 %)	149.94	60.68
WHC	.232	.015-.450	(94 %)	4570	2348-6792	(49 %)	201.65	81.61
YEB	.002	.000-.004	(97 %)	88	+-178	(103 %)	3.87	1.57
MSC	.000	+-.001	(140 %)	27	+-63	(138 %)	1.17	.48
TOT	.975	.754-1.195	(23 %)	29975	25919-34031	(14 %)	1322.61	535.26

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.005	.002-.009	(68 %)	123	69-177	(44 %)	5.445	153.9
BLG	.016	.011-.021	(30 %)	609	458-760	(25 %)	26.883	42.2
CCF	.018	.013-.023	(29 %)	477	325-629	(32 %)	21.046	367.6
GSF	.000	+-.000	(111 %)	5	2-8	(56 %)	.222	37.2
GZS	.000	+-.000	(105 %)	15	+-32	(121 %)	.646	69.8
LMB	.090	.058-.122	(36 %)	2288	1693-2883	(26 %)	100.954	455.7
RBT	.022	.015-.029	(30 %)	946	609-1282	(36 %)	41.725	278.3
WHC	.037	+-.076	(105 %)	635	266-1005	(58 %)	28.028	139.0
YEB	.000	+-.000	(103 %)	19	+-37	(101 %)	.819	211.6
MSC	.000	+-.000	(185 %)	2	+-4	(104 %)	.079	67.1
TOT	.189	.148-.229	(22 %)	5118	4438-5799	(13 %)	225.848	170.8

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.012	.004-.020	(68 %)	272	153-391	(44 %)	4.858	.3393
BLG	.035	.024-.045	(30 %)	1343	1010-1676	(25 %)	23.985	.0931
CCF	.039	.028-.051	(29 %)	1052	716-1387	(32 %)	18.778	.8104
GSF	.000	+-.000	(111 %)	11	5-17	(56 %)	.198	.0820
GZS	.000	+-.000	(105 %)	32	+-71	(121 %)	.577	.1538
LMB	.198	.127-.268	(36 %)	5044	3733-6355	(26 %)	90.071	1.0046
RBT	.049	.034-.064	(30 %)	2085	1343-2827	(36 %)	37.227	.6135
WHC	.081	+-.167	(105 %)	1400	586-2215	(58 %)	25.007	.3064
YEB	.000	+-.002	(103 %)	41	+-82	(101 %)	.731	.4664
MSC	.000	+-.000	(185 %)	4	+-8	(104 %)	.070	.1478
TOT	.416	.326-.505	(22 %)	11284	9784-12784	(13 %)	201.502	.3765

TABLE BEAVER DAM 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=BEAVER DAM LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	3.8	3.7 - 4	(4%)	.3	10.8	636
SHORE	2.7	2.5 - 2.8	(5%)	.2	10.4	516
BOAT & SHORE	3.3	3.2 - 3.4	(3%)	.2	10.8	1152

588 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
60.1% OF ALL 1917 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	35.2	32.8 - 37.6	(7%)	1	900	1912
SUCCESS RATING 1-10?	3.2	3.1 - 3.3	(4%)	1	10	1908

IS CATCH ILLEGAL?
CLERK NOTED 5 OUT OF 1917 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	451	(23.5%)	CRP	83	(4.3%)
SUN	189	(9.9%)	LMB	402	(21%)
RBT	211	(11%)	CCF	246	(12.8%)
BLG	296	(15.4%)	WHC	38	(2%)
BLC	1	(.1%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	155	1	401
2	520	2	448
3	141	3	104
4	42	4	76
5	2	5	18
6		6	7
7		7	2
8		8	1
9		9	
10+		10+	

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=3 LAKE :=CLINTON LAKE
DISTRICT :=13 YEAR :=95
ACREAGE :4895 SAMPLING RATIO :=717/2952 = 24.2%
NUMBER OF INTERVIEWS:6325

YEAR PERIOD 03/15 TO 04/08 OF SECTION 2 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1 COALESCED WITH
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	92482	82668-102296	(11%)	19	17-21	(11%)	7.93
WKND/HOL	83816	75184-92448	(10%)	17	15-19	(10%)	13.92
STR TOTAL	176298	163376-189220	(7%)	36	33-39	(7%)	10.78
SHORE FISHING:							
WEEKDAY	29020	25664-32376	(12%)	6	5-7	(12%)	6.27
WKND/HOL	22520	19830-25210	(12%)	5	4-5	(12%)	12.57
STR TOTAL	51540	47278-55802	(8%)	11	10-11	(8%)	9.02
BOAT/SHORE COALESCED:							
WEEKDAY	120779	109661-131897	(9%)	25	22-27	(9%)	7.58
WKND/HOL	105616	95447-115785	(10%)	22	19-24	(10%)	13.72
STR TOTAL	226395	211526-241264	(7%)	46	43-49	(7%)	10.45
BOAT/SHORE STRATIFIED:							
WEEKDAY	121504	111161-131847	(9%)	25	23-27	(9%)	7.54
WKND/HOL	106338	97342-115334	(8%)	22	20-24	(8%)	13.63
STR TOTAL	227842	214260-241424	(6%)	47	44-49	(6%)	10.38

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=3 LAKE :=CLINTON LAKE
DISTRICT :=13 YEAR :=95
ACREAGE :4895 SAMPLING RATIO :=1434/5904 = 24.2%
RATIO OF EFFORT HOURS INTERVIEWED := 23651.7/227845.2 = 10.38%
NUMBER OF INTERVIEWS: 6325

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 2 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1 COALESCED WITH
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4

MSC SPECIES CAUGHT:
FRD CAP SMB GSF BLB YEB RSF FCF WAM LOG BGB MUE BGH GIS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.010	.006-.014	(41 %)	3254	1615-4893	(50 %)	1.64	.67
BLG	.079	.042-.116	(46 %)	12650	9070-16230	(28 %)	6.39	2.59
CCF	.043	.034-.052	(20 %)	10283	8382-12184	(18 %)	5.19	2.10
LMB	.003	+-.007	(118 %)	786	529-1043	(33 %)	.40	.16
SBH	.000	+-.002	(123 %)	161	+-322	(100 %)	.08	.03
STB	.000	+-.000	(257 %)	3	+-10	(257 %)	.00	.00
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAE	.002	.000-.002	(42 %)	1122	546-1698	(51 %)	.57	.23
WHC	.179	.156-.202	(13 %)	62407	51399-73416	(18 %)	31.50	12.75
MSC	.005	.003-.007	(42 %)	874	605-1142	(31 %)	.44	.18
TOT	.322	.279-.365	(13 %)	91540	78667-104413	(14 %)	46.21	18.70

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.002	.001-.003	(41 %)	706	349-1063	(51 %)	.356	217.0
BLG	.005	.003-.008	(41 %)	879	651-1108	(26 %)	.444	69.5
CCF	.029	.021-.037	(29 %)	6601	4944-8258	(25 %)	3.332	641.9
LMB	.003	+-.006	(111 %)	788	514-1062	(35 %)	.398	1002.3
SBH	.002	+-.004	(122 %)	514	+-1212	(136 %)	.260	3202.0
STB	.000	+-.000	(257 %)	2	+-8	(257 %)	.001	832.5
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAE	.001	.000-.002	(47 %)	917	476-1358	(48 %)	.463	817.0
WHC	.036	.032-.041	(13 %)	12491	10292-14691	(18 %)	6.306	200.2
MSC	.001	.000-.002	(47 %)	289	173-405	(40 %)	.146	331.0
TOT	.080	.070-.090	(13 %)	23188	20067-26309	(13 %)	11.705	253.3

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.005	.003-.006	(41 %)	1557	769-2344	(51 %)	.318	.4784
BLG	.012	.007-.017	(41 %)	1938	1434-2442	(26 %)	.396	.1532
CCF	.064	.045-.083	(29 %)	14552	10899-18205	(25 %)	2.973	1.4151
LMB	.007	+-.014	(111 %)	1737	1133-2341	(35 %)	.355	2.2096
SBH	.004	+-.008	(122 %)	1134	+-2673	(136 %)	.232	7.0591
STB	.000	+-.000	(257 %)	5	+-17	(257 %)	.000	1.8354
TGM		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAE	.003	.001-.004	(47 %)	2021	1050-2993	(48 %)	.413	1.8013
WHC	.080	.070-.090	(13 %)	27538	22689-32388	(18 %)	5.626	.4413
MSC	.003	.002-.004	(47 %)	638	382-893	(40 %)	.130	.7297
TOT	.177	.154-.199	(13 %)	51119	44239-58000	(13 %)	10.443	.5584

```
CAUGHT AND CPUE TABLE          ***  DAY  ***
REGION    :=3              LAKE :=CLINTON LAKE
DISTRICT :=13              YEAR :=95
ACREAGE  :4895             SAMPLING RATIO :=1434/5904   = 24.2%
RATIO OF EFFORT HOURS INTERVIEWED := 23651.7/227845.2   = 10.38%
NUMBER OF INTERVIEWS: 6325

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 2 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1 COALESCED WITH
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4
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MSC SPECIES CAUGHT:
FRD CAP SMB GSF BLB YEB RSF FCF WAM LOG BGB MUE BGH GZS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.017	.011-.023	(34 %)	5517	3011-8013	(45 %)	2.78	1.13
BLG	.271	.218-.324	(20 %)	47299	38895-55704	(18 %)	23.88	9.66
CCF	.086	.071-.100	(17 %)	19234	16213-22255	(16 %)	9.71	3.93
LMB	.062	.049-.075	(21 %)	15632	12906-18359	(17 %)	7.89	3.20
SBH	.036	.023-.048	(35 %)	6831	4755-8907	(30 %)	3.45	1.40
STB	.002	.000-.003	(90 %)	298	+-633	(113 %)	.15	.06
TGM	.000	.000-.001	(93 %)	358	73-643	(80 %)	.18	.08
WAE	.003	.001-.004	(40 %)	1792	578-3006	(68 %)	.90	.37
WHC	.372	.322-.423	(14 %)	129642	109605-149678	(15 %)	65.44	26.49
MSC	.063	.049-.078	(23 %)	12585	10097-15073	(20 %)	6.35	2.57
TOT	.912	.829-.994	(9 %)	239183	214020-264346	(11 %)	120.74	48.86

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.003	.002-.004	(36 %)	961	495-1427	(48 %)	.485	174.4
BLG	.012	.009-.015	(22 %)	2028	1698-2358	(16 %)	1.024	42.9
CCF	.037	.027-.048	(28 %)	8079	6164-9995	(24 %)	4.078	420.0
LMB	.026	.020-.033	(24 %)	7538	5969-9107	(21 %)	3.805	482.2
SBH	.009	.005-.012	(45 %)	1626	857-2394	(47 %)	.821	238.0
STB	.000	+-.002	(122 %)	112	+-224	(100 %)	.056	376.0
TGM	.000	+-.000	(105 %)	223	41-406	(82 %)	.113	623.2
WAE	.002	.001-.002	(39 %)	1204	658-1751	(45 %)	.608	671.9
WHC	.057	.050-.064	(12 %)	19895	16694-23096	(16 %)	10.043	153.5
MSC	.019	.010-.028	(48 %)	3185	1725-4645	(46 %)	1.608	253.1
TOT	.167	.149-.184	(10 %)	44851	39707-49996	(11 %)	22.641	187.5

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.007	.004-.009	(36 %)	2119	1092-3146	(48 %)	.433	.3845
BLG	.026	.020-.032	(22 %)	4471	3743-5198	(16 %)	.913	.0945
CCF	.082	.058-.105	(28 %)	17811	13588-22034	(24 %)	3.639	.9260
LMB	.058	.044-.072	(24 %)	16618	13158-20078	(21 %)	3.395	1.0631
SBH	.019	.010-.027	(45 %)	3584	1890-5278	(47 %)	.732	.5247
STB	.002	+-.005	(122 %)	247	+-494	(100 %)	.050	.8289
TGM	.000	+-.002	(105 %)	492	90-894	(82 %)	.101	1.3739
WAE	.004	.002-.005	(39 %)	2655	1450-3860	(45 %)	.542	1.4813
WHC	.126	.111-.142	(12 %)	43861	38804-50918	(16 %)	8.960	.3383
MSC	.042	.022-.062	(48 %)	7022	3804-10241	(46 %)	1.435	.5580
TOT	.367	.329-.405	(10 %)	98880	87538-110221	(11 %)	20.200	.4134

```
HARVESTED AND CPUE TABLE          ***  DAY  ***
REGION    :=3              LAKE :=CLINTON LAKE
DISTRICT :=13              YEAR :=95
ACREAGE  :4895             SAMPLING RATIO :=1434/5904  = 24.2%
RATIO OF EFFORT HOURS INTERVIEWED := 23651.7/227845.2  = 10.38%
NUMBER OF INTERVIEWS: 6325

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 2 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
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YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
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YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
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YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4
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MSC SPECIES CAUGHT:
WHC BLC LMB BLG STB TGM CCF WAE SBH RSF LOG BGB MUE GZS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLB	.000	+-.001	(112 %)	99	15-184	(85 %)	.05	.02
BGH	.000	+-.000	(237 %)	5	+-15	(237 %)	.00	.00
CAP	.000	.000-.001	(69 %)	183	82-284	(55 %)	.09	.04
FCF		*** NOT RECORDED ***			*** NOT RECORDED ***			
FRD	.002	.000-.003	(86 %)	366	162-571	(56 %)	.18	.08
GSF	.000	.000-.001	(82 %)	146	42-250	(71 %)	.07	.03
SMB	.000	+-.000	(257 %)	6	+-21	(257 %)	.00	.00
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
YEB	.000	+-.002	(148 %)	67	+-140	(109 %)	.03	.02
MSC	.317	.274-.360	(14 %)	90668	77814-103523	(14 %)	45.77	18.52
TOT	.322	.279-.365	(13 %)	91540	78667-104413	(14 %)	46.21	18.70

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLB	.000	+-.000	(138 %)	53	-106	(98 %)	.027	536.3
BGH	.000	+-.000	(237 %)		+-1	(236 %)	.000	82.4
CAP	.000	.000-.000	(69 %)	64	26-101	(59 %)	.032	348.2
FCF		*** NOT RECORDED ***			*** NOT RECORDED ***			
FRD	.000	.000-.001	(89 %)	143	45-240	(68 %)	.072	389.1
GSF	.000	.000-.000	(92 %)	13	+-26	(102 %)	.007	89.0
SMB	.000	+-.000	(257 %)	4	+-16	(257 %)	.002	759.1
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
YEB	.000	+-.000	(143 %)	12	-24	(100 %)	.006	176.5
MSC	.079	.069-.089	(13 %)	22898	19784-26013	(14 %)	11.559	252.6
TOT	.080	.070-.090	(13 %)	23188	20067-26309	(13 %)	11.705	253.3

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLB	.000	+-.002	(138 %)	118	2-233	(98 %)	.024	1.1824
BGH	.000	+-.000	(237 %)		+-3	(236 %)	.000	.1816
CAP	.000	.000-.001	(69 %)	140	58-223	(59 %)	.029	.7677
FCF		*** NOT RECORDED ***			*** NOT RECORDED ***			
FRD	.001	.000-.002	(89 %)	314	99-529	(68 %)	.064	.8577
GSF	.000	.000-.000	(92 %)	29	+-58	(102 %)	.006	.1962
SMB	.000	+-.000	(257 %)	10	+-35	(257 %)	.002	1.6734
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
YEB	.000	+-.000	(143 %)	26	-52	(100 %)	.005	.3890
MSC	.174	.151-.196	(13 %)	50482	43615-57349	(14 %)	10.313	.5568
TOT	.177	.154-.199	(13 %)	51119	44239-58000	(13 %)	10.443	.5584

```
CAUGHT AND CPUE TABLE          ***  DAY  ***
REGION    :=3                LAKE :=CLINTON LAKE
DISTRICT  :=13               YEAR :=95
ACREAGE   :4895              SAMPLING RATIO :=1434/5904   = 24.2%
RATIO OF EFFORT HOURS INTERVIEWED := 23651.7/227845.2  = 10.38%
NUMBER OF INTERVIEWS: 6325

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 2 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
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YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3 COALESCED WITH
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
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YEAR PERIOD 09/01 TO 09/30 OF SECTION 1 COALESCED WITH
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YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1 COALESCED WITH
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4
```

MSC SPECIES CAUGHT:
WHC BLC LMB BLG STB TGM CCF WAE SBH RSF LOG BGB MUE GIS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLB	.002	+-.005	(132 %)	313	37-588	(88 %)	.16	.07
BGH	.000	+-.000	(237 %)	5	+-15	(237 %)	.00	.00
CAP	.011	.002-.021	(80 %)	1648	1280-2017	(22 %)	.83	.34
FCF	.000	+-.000	(173 %)	6	+-21	(249 %)	.00	.00
FRD	.031	.020-.042	(35 %)	7288	5069-9507	(30 %)	3.68	1.49
GSF	.011	.006-.017	(50 %)	2205	1283-3127	(42 %)	1.11	.45
SMB	.004	.000-.007	(85 %)	565	291-838	(48 %)	.29	.12
WAM	.000	+-.000	(318 %)	9	+-36	(318 %)	.00	.00
YEB	.002	.000-.003	(73 %)	241	80-401	(67 %)	.12	.05
MSC	.851	.771-.930	(9 %)	226904	202151-251657	(11 %)	114.54	46.36
TOT	.912	.829-.994	(9 %)	239183	214020-264346	(11 %)	120.74	48.86

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLB	.000	+-.003	(189 %)	124	+-304	(146 %)	.062	395.5
BGH	.000	+-.000	(237 %)		+-1	(236 %)	.000	82.4
CAP	.006	+-.014	(148 %)	571	375-767	(34 %)	.288	346.1
FCF	.000	+-.000	(208 %)	38	+-113	(200 %)	.019	6182.0
FRD	.008	.003-.013	(67 %)	2008	565-3451	(72 %)	1.014	275.5
GSF	.000	.000-.000	(43 %)	73	48-97	(34 %)	.037	32.9
SMB	.000	.000-.002	(94 %)	167	92-241	(45 %)	.084	295.1
WAM	.000	+-.000	(318 %)		+-4	(318 %)	.000	110.8
YEB	.000	.000-.000	(83 %)	41	+-85	(111 %)	.020	168.3
MSC	.150	.135-.166	(10 %)	41814	37035-46594	(11 %)	21.108	184.3
TOT	.166	.149-.184	(10 %)	44835	39692-49979	(11 %)	22.633	187.5

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLB	.002	+-.006	(189 %)	273	+-670	(146 %)	.056	.8719
BGH	.000	+-.000	(237 %)		+-3	(236 %)	.000	.1816
CAP	.013	+-.032	(148 %)	1258	826-1690	(34 %)	.257	.7631
FCF	.000	+-.000	(208 %)	83	+-250	(200 %)	.017	13.6287
FRD	.017	.006-.028	(67 %)	4427	1245-7609	(72 %)	.904	.6074
GSF	.000	.000-.001	(43 %)	160	106-214	(34 %)	.033	.0726
SMB	.002	.000-.004	(94 %)	367	203-531	(45 %)	.075	.6506
WAM	.000	+-.000	(318 %)	2	+-9	(318 %)	.000	.2443
YEB	.000	.000-.001	(83 %)	89	+-188	(111 %)	.018	.3711
MSC	.331	.297-.366	(10 %)	92184	81647-102720	(11 %)	18.832	.4063
TOT	.367	.329-.405	(10 %)	98844	87505-110183	(11 %)	20.193	.4133

TABLE CLINTON LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=CLINTON LAKE CREEL BEGUN IN YEAR=95

SECTION	1	FROM	03/15	TO 04/08
SECTION	1	FROM	04/09	TO 04/30
SECTION	1	FROM	05/01	TO 05/31
SECTION	1	FROM	06/01	TO 06/15
SECTION	1	FROM	06/16	TO 08/31
SECTION	1	FROM	09/01	TO 09/30
SECTION	1	FROM	10/01	TO 10/31
SECTION	1	FROM	11/01	TO 11/15
SECTION	2	FROM	03/15	TO 04/08
SECTION	2	FROM	04/09	TO 04/30
SECTION	2	FROM	05/01	TO 05/31
SECTION	2	FROM	06/01	TO 06/15
SECTION	2	FROM	06/16	TO 08/31
SECTION	2	FROM	09/01	TO 09/30
SECTION	2	FROM	10/01	TO 10/31
SECTION	2	FROM	11/01	TO 11/15
SECTION	3	FROM	03/15	TO 04/08
SECTION	3	FROM	04/09	TO 04/30
SECTION	3	FROM	05/01	TO 05/31
SECTION	3	FROM	06/01	TO 06/15
SECTION	3	FROM	06/16	TO 08/31
SECTION	3	FROM	09/01	TO 09/30
SECTION	3	FROM	10/01	TO 10/31
SECTION	3	FROM	11/01	TO 11/15
SECTION	4	FROM	03/15	TO 04/08
SECTION	4	FROM	04/09	TO 04/30
SECTION	4	FROM	05/01	TO 05/31
SECTION	4	FROM	06/01	TO 06/15
SECTION	4	FROM	06/16	TO 08/31
SECTION	4	FROM	09/01	TO 09/30
SECTION	4	FROM	10/01	TO 10/31
SECTION	4	FROM	11/01	TO 11/15

TABLE CLINTON LAKE 1995 DAY CREEL FINAL REPORT CONTINUED
DAYTIME DATA FOR LAKE=CLINTON LAKE CREEL BEGUN IN YEAR=95

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL.	OF MEAN	MIN.	MAX.	#SAMPLES
BOAT	4.3	4.2 - 4.5	(4%)	.3	14.3	788
SHORE	2.3	2.1 - 2.5	(10%)	.3	7	168
BOAT & SHORE	4	3.8 - 4.1	(4%)	.3	14.3	956

559 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
16% OF ALL 5989 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL.	OF MEAN	MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	42.4	41.3 - 43.5	(3%)	1	900	5966
SUCCESS RATING 1-10?	3.3	3.2 - 3.3	(2%)	1	10	5425

IS CATCH ILLEGAL?
CLERK NOTED 17 OUT OF 5989 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	1503	(25.1%)	CRP	2337	(39%)
LMB	723	(12.1%)	CAT	459	(7.7%)
BSS	321	(5.4%)	MOR	197	(3.3%)
WAE	184	(3.1%)	CCF	158	(2.6%)
BLG	48	(.8%)	WHC	45	(.8%)
STB	6	(.1%)	BLB	1	(0%)
BLC	1	(0%)	SMB	2	(0%)
FCF	1	(0%)	CAP	2	(0%)
SUN	1	(0%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT	SHORE
1	1068	771
2	2602	609
3	540	190
4	98	73
5	8	17
6	1	6
7		7
8	1	8
9		9
10+	1	10+

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=3 LAKE :=CLINTON LK TAILWATER
DISTRICT :=13 YEAR :=95
ACREAGE :5 SAMPLING RATIO :=199/738 = 26.9%
NUMBER OF INTERVIEWS:2234

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	0		(0%)	0		(0%)	
WKND/HOL	0		(0%)	0		(0%)	
STR TOTAL	0		(0%)	0		(0%)	0
SHORE FISHING:							
WEEKDAY	18004	15824-20184	(12%)	3601	3165-4037	(12%)	13.89
WKND/HOL	15973	14017-17929	(12%)	3195	2803-3586	(12%)	29.59
STR TOTAL	33977	31136-36818	(8%)	6795	6227-7364	(8%)	21.27
BOAT/SHORE COALESCED:							
WEEKDAY	18004	15824-20184	(12%)	3601	3165-4037	(12%)	13.89
WKND/HOL	15973	14017-17929	(12%)	3195	2803-3586	(12%)	29.59
STR TOTAL	33977	31136-36818	(8%)	6795	6227-7364	(8%)	21.27
BOAT/SHORE STRATIFIED:							
WEEKDAY	18004	15824-20184	(12%)	3601	3165-4037	(12%)	13.89
WKND/HOL	15973	14017-17929	(12%)	3195	2803-3586	(12%)	29.59
STR TOTAL	33977	31136-36818	(8%)	6795	6227-7364	(8%)	21.27

CAUGHT AND CPUE TABLE BY SUBSTRATUM ACROSS STRATA *** DAY ***
REGION :=3 LAKE :=CLINTON LK TAILWATER
DISTRICT :=13 YEAR :=95
ACREAGE :5 SAMPLING RATIO :=199/738 = 26.9%
RATIO OF EFFORT HOURS INTERVIEWED := 7226/33980.9 = 21.26%
NUMBER OF INTERVIEWS: 2234

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
CAP GOR FRD GZS BGB SHR BLB GSF LOG SMB FCF YEB
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE COALESCED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.002	+-.004	(132 %)	51	5-97	(90 %)	25.20	10.20
BLG	.248	.183-.312	(26 %)	7511	5563-9459	(26 %)	3711.98	1502.22
CCF	.103	.074-.133	(29 %)	3142	2204-4081	(30 %)	1552.89	628.45
LMB	.022	.013-.031	(41 %)	671	408-735	(29 %)	282.32	114.26
SBH	.281	.149-.413	(47 %)	7715	5263-10167	(32 %)	3812.83	1543.03
STB	.003	.001-.005	(60 %)	142	57-227	(60 %)	70.24	28.43
TGM	.002	+-.007	(227 %)	25	+-53	(111 %)	12.53	5.07
WAE	.009	.002-.016	(76 %)	275	157-394	(43 %)	135.97	55.03
WHC	.033	.004-.063	(89 %)	1303	675-1932	(48 %)	644.06	260.65
MSC	.260	.203-.316	(22 %)	8581	6818-10343	(21 %)	4240.64	1716.17
TOT	.963	.818-1.107	(15 %)	29318	25362-33273	(13 %)	14488.6	5863.49

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.000	.000-.000	(98 %)	8	+-17	(105 %)	4.037	160.2
BLG	.007	.005-.009	(25 %)	234	173-295	(26 %)	115.775	31.2
CCF	.012	.008-.015	(28 %)	387	263-511	(32 %)	191.163	123.1
LMB	.008	.005-.011	(42 %)	218	150-286	(31 %)	107.591	381.1
SBH	.352	+-.845	(140 %)	8352	6529-10175	(22 %)	4127.42	1082.5
STB	.006	.000-.011	(94 %)	256	38-475	(85 %)	126.657	1803.1
TGM	.001	+-.005	(236 %)	29	+-79	(175 %)	14.252	1137.7
WAE	.009	+-.021	(120 %)	247	85-408	(65 %)	121.916	896.6
WHC	.004	.002-.006	(54 %)	155	75-235	(52 %)	76.492	118.8
MSC	.075	.048-.102	(36 %)	2424	1835-3013	(24 %)	1198.02	282.5
TOT	.474	+-.957	(102 %)	12310	10235-14384	(17 %)	6083.33	419.9

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	.000-.000	(98 %)	18	+-37	(105 %)	3.601	.3531
BLG	.015	.012-.019	(25 %)	516	382-651	(26 %)	103.295	.0688
CCF	.026	.019-.033	(28 %)	853	580-1126	(32 %)	170.556	.2714
LMB	.017	.010-.025	(42 %)	480	330-630	(31 %)	95.993	.8402
SBH	.776	+-1.862	(140 %)	18412	14394-22431	(22 %)	3682.49	2.3865
STB	.012	.000-.024	(94 %)	565	83-1047	(85 %)	113.004	3.9751
TGM	.003	+-.010	(236 %)	64	+-175	(175 %)	12.715	2.5081
WAE	.021	+-.046	(120 %)	544	188-900	(65 %)	108.773	1.9767
WHC	.008	.004-.013	(54 %)	341	165-517	(52 %)	68.246	.2618
MSC	.165	.106-.224	(36 %)	5344	4046-6642	(24 %)	1068.88	.6228
TOT	1.045	+-2.110	(102 %)	27138	22564-31711	(17 %)	5427.56	.9256

HARVESTED AND CPUE TABLE BY SUBSTRATUM ACROSS STRATA *** DAY ***
REGION :=3 LAKE :=CLINTON LK TAILWATER
DISTRICT :=13 YEAR :=95
ACREAGE :5 SAMPLING RATIO :=199/738 = 26.9%
RATIO OF EFFORT HOURS INTERVIEWED := 7226/33980.9 = 21.26%
NUMBER OF INTERVIEWS: 2234

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
CAP GOR FRD GZS BGB SHR BLB GSF LOG SMB FCF YEB
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE COALESCED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.000	+-.002	(218 %)	21	+-66	(207 %)	10.61	4.30
BLG	.043	.016-.069	(62 %)	1600	876-2324	(45 %)	790.85	320.05
CCF	.022	.011-.033	(51 %)	900	395-1404	(56 %)	444.68	179.96
LMB	.001	.000-.002	(81 %)	44	13-76	(70 %)	21.94	8.88
SBH	.106	+-.264	(149 %)	2882	2176-3588	(24 %)	1424.14	576.34
STB	.002	.000-.004	(73 %)	110	34-187	(69 %)	54.46	22.04
TGM	.000	+-.000	(318 %)	5	+-19	(318 %)	2.29	.93
WAE	.006	+-.013	(104 %)	172	63-282	(63 %)	85.22	34.49
WHC	.006	+-.023	(262 %)	252	+-1073	(326 %)	124.47	50.37
MSC	.053	.029-.077	(45 %)	1993	1467-2520	(26 %)	985.13	398.68
TOT	.240	.104-.377	(57 %)	7980	6568-9392	(18 %)	3943.78	1596.03

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.000	+-.000	(431 %)	4	+-15	(248 %)	2.168	204.4
BLG	.002	.001-.003	(50 %)	80	42-119	(48 %)	39.630	50.1
CCF	.006	.003-.008	(45 %)	219	121-316	(44 %)	107.994	242.9
LMB	.001	.000-.002	(82 %)	49	12-86	(76 %)	24.116	1099.1
SBH	.276	+-.778	(182 %)	5911	4443-7379	(25 %)	2921.30	2051.3
STB	.005	.000-.011	(98 %)	243	25-461	(90 %)	119.978	2203.2
TGM	.000	+-.002	(318 %)	16	+-68	(318 %)	8.057	3524.3
WAE	.009	+-.020	(128 %)	223	62-383	(72 %)	110.025	1291.1
WHC	.001	+-.005	(255 %)	51	+-217	(325 %)	25.208	202.5
MSC	.021	.015-.027	(29 %)	866	656-1076	(24 %)	427.978	434.4
TOT	.321	+-.822	(156 %)	7662	6082-9242	(21 %)	3786.45	960.1

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	+-.001	(431 %)	10	+-34	(248 %)	1.934	.4506
BLG	.005	.002-.007	(50 %)	177	92-261	(48 %)	35.358	.1105
CCF	.013	.007-.019	(45 %)	482	268-696	(44 %)	96.352	.5354
LMB	.002	.000-.004	(82 %)	108	26-189	(76 %)	21.516	2.4230
SBH	.607	+-1.714	(182 %)	13032	9796-16268	(25 %)	2606.39	4.5222
STB	.012	.000-.024	(98 %)	535	55-1016	(90 %)	107.045	4.8572
TGM	.000	+-.004	(318 %)	36	+-150	(318 %)	7.189	7.7696
WAE	.019	+-.044	(128 %)	491	138-844	(72 %)	98.164	2.8463
WHC	.003	+-.010	(255 %)	112	+-478	(325 %)	22.490	.4465
MSC	.046	.033-.059	(29 %)	1909	1445-2373	(24 %)	381.843	.9578
TOT	.708	+-1.813	(156 %)	16891	13408-20375	(21 %)	3378.28	2.1167

CAUGHT AND CPUE TABLE BY SUBSTRATUM ACROSS STRATA *** DAY ***
REGION :=3 LAKE :=CLINTON LK TAILWATER
DISTRICT :=13 YEAR :=95
ACREAGE :5 SAMPLING RATIO :=199/738 = 26.9%
RATIO OF EFFORT HOURS INTERVIEWED := 7226/33980.9 = 21.26%
NUMBER OF INTERVIEWS: 2234

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
WAE SBH CCF GZS LMB BLG WHC STB BLB BLC LOG TGM
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE COALESCED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BGB	.012	.004-.020	(68 %)	414	205-623	(51 %)	204.61	82.81
CAP	.028	.015-.041	(46 %)	810	535-1085	(34 %)	400.43	162.05
FCF	.003	+-.006	(135 %)	55	16-94	(71 %)	27.09	10.97
FRD	.178	.128-.227	(28 %)	6082	4555-7609	(25 %)	3005.66	1216.38
GOR	.002	+-.006	(227 %)	47	+-96	(103 %)	23.37	9.46
GSF	.006	+-.015	(151 %)	107	+-293	(174 %)	52.78	21.36
SHR	.002	+-.006	(229 %)	118	+-360	(205 %)	58.33	23.61
SMB	.005	.000-.009	(84 %)	110	34-187	(69 %)	54.42	22.03
YEB	.000	+-.001	(183 %)	34	+-95	(182 %)	16.62	6.73
MSC	.728	.589-.867	(19 %)	21541	18058-25024	(16 %)	10645.3	4308.11
TOT	.963	.818-1.107	(15 %)	29318	25362-33273	(13 %)	14488.6	5863.49

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BGB	.019	.001-.036	(94 %)	682	248-1116	(64 %)	336.880	1646.4
CAP	.010	.006-.015	(45 %)	296	180-412	(39 %)	146.226	365.2
FCF	.005	+-.014	(196 %)	140	+-670	(378 %)	69.187	2553.9
FRD	.035	.015-.054	(56 %)	1062	758-1367	(29 %)	525.022	174.7
GOR	.000	+-.004	(564 %)	18	+-41	(125 %)	9.057	387.6
GSF	.000	+-.000	(250 %)	6	+-21	(239 %)	3.011	57.0
SHR	.000	+-.006	(655 %)	56	+-409	(635 %)	27.490	471.3
SMB	.002	+-.004	(103 %)	47	12-83	(75 %)	23.440	430.7
YEB	.000	+-.000	(186 %)	6	+-17	(187 %)	2.940	176.9
MSC	.402	+-.892	(122 %)	9969	8049-11889	(19 %)	4926.61	462.8
TOT	.474	+-.957	(102 %)	12282	10215-14350	(17 %)	6069.86	418.9

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BGB	.041	.002-.080	(94 %)	1503	546-2460	(64 %)	300.565	3.6297
CAP	.022	.012-.032	(45 %)	652	397-907	(39 %)	130.463	.8051
FCF	.010	+-.030	(196 %)	309	+-1476	(378 %)	61.729	5.6303
FRD	.077	.034-.120	(56 %)	2342	1671-3013	(29 %)	468.425	.3851
GOR	.001	+-.010	(564 %)	40	+-91	(125 %)	8.081	.8545
GSF	.000	+-.002	(250 %)	13	+-46	(239 %)	2.686	.1258
SHR	.002	+-.014	(655 %)	123	+-901	(635 %)	24.527	1.0390
SMB	.005	+-.009	(103 %)	105	26-183	(75 %)	20.914	.9495
YEB	.000	+-.000	(186 %)	13	+-38	(187 %)	2.623	.3899
MSC	.886	+-1.967	(122 %)	21978	17744-26211	(19 %)	4395.53	1.0203
TOT	1.044	+-2.109	(102 %)	27078	22521-31635	(17 %)	5415.54	.9236

HARVESTED AND CPUE TABLE BY SUBSTRATUM ACROSS STRATA *** DAY ***
REGION :=3 LAKE :=CLINTON LK TAILWATER
DISTRICT :=13 YEAR :=95
ACREAGE :5 SAMPLING RATIO :=199/738 = 26.9%
RATIO OF EFFORT HOURS INTERVIEWED := 7226/33980.9 = 21.26%
NUMBER OF INTERVIEWS: 2234

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
WAE SBH CCF GZS LMB BLG WHC STB BLB BLC LOG TGM
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE COALESCED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BGB	.003	.001-.004	(53 %)	146	72-219	(50 %)	72.05	29.16
CAP	.012	.001-.022	(90 %)	333	148-518	(56 %)	164.62	66.62
FCF	.001	.000-.002	(82 %)	44	8-80	(81 %)	21.92	8.87
FRD	.024	.011-.038	(56 %)	1122	697-1547	(38 %)	554.34	224.34
GOR	.000	+-.000	(145 %)	17	+-41	(138 %)	8.52	3.45
GSF	.000	+-.002	(904 %)	6	+-65	(106 %)	2.76	1.12
SHR	.000	+-.001	(133 %)	42	+-86	(103 %)	20.87	8.45
SMB	.000		(0 %)	1		(0 %)	.69	.28
YEB	.000	+-.001	(183 %)	34	+-95	(182 %)	16.62	6.73
MSC	.199	.054-.344	(73 %)	6235	4924-7546	(21 %)	3081.39	1247.02
TOT	.240	.104-.377	(57 %)	7980	6568-9392	(18 %)	3943.78	1596.03

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BGB	.006	.002-.011	(69 %)	305	130-480	(57 %)	150.519	2089.2
CAP	.004	.000-.007	(77 %)	125	43-207	(65 %)	61.787	375.3
FCF	.004	+-.019	(404 %)	136	+-668	(392 %)	67.026	3057.1
FRD	.005	.002-.007	(54 %)	217	132-301	(39 %)	107.027	193.1
GOR	.000	+-.000	(170 %)	7	+-17	(145 %)	3.503	411.3
GSF	.000	+-.000	(923 %)		+-2	(963 %)	.095	34.3
SHR	.000	+-.000	(306 %)	17	+-39	(125 %)	8.485	406.6
SMB	.000		(0 %)	2		(0 %)	.819	1194.5
YEB	.000	+-.000	(186 %)	6	+-17	(187 %)	2.940	176.9
MSC	.302	+-.803	(166 %)	6848	5292-8404	(23 %)	3384.24	1098.3
TOT	.321	+-.822	(156 %)	7662	6082-9242	(21 %)	3786.45	960.1

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BGB	.014	.004-.024	(69 %)	671	286-1057	(57 %)	134.294	4.6058
CAP	.008	.002-.015	(77 %)	276	96-455	(65 %)	55.126	.8275
FCF	.008	+-.042	(404 %)	299	+-1472	(392 %)	59.801	6.7397
FRD	.011	.005-.016	(54 %)	477	291-664	(39 %)	95.490	.4256
GOR	.000	+-.000	(170 %)	16	+-38	(145 %)	3.126	.9067
GSF	.000	+-.000	(923 %)		+-4	(963 %)	.085	.0757
SHR	.000	+-.002	(306 %)	38	+-85	(125 %)	7.571	.8965
SMB	.000		(0 %)	4		(0 %)	.731	2.6335
YEB	.000	+-.000	(186 %)	13	+-38	(187 %)	2.623	.3899
MSC	.666	+-1.771	(166 %)	15097	11666-18528	(23 %)	3019.43	2.4213
TOT	.708	+-1.813	(156 %)	16891	13408-20375	(21 %)	3378.27	2.1167

TABLE CLINTON TAILWATER 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=CLINTON LK TAILWATER CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	*** NO DATA ***					
SHORE	2.8	2.7 - 2.9	(4%)	.3	13.7	1201
BOAT & SHORE	2.8	2.7 - 2.9	(4%)	.3	13.7	1201

493 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
67.5% OF ALL 1779 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	35.4	33.9 - 36.8	(4%)	1	500	1766
SUCCESS RATING 1-10?	3.2	3 - 3.3	(4%)	1	10	1620

IS CATCH ILLEGAL?
CLERK NOTED 6 OUT OF 1779 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	891	(50.1%)	MOR	741	(41.7%)
WAE	49	(2.8%)	CCF	9	(.5%)
MUE	1	(.1%)	CRP	16	(.9%)
SBH	10	(.6%)	BGS	7	(.4%)
CAT	44	(2.5%)	CAP	4	(.2%)
GZS	1	(.1%)	LMB	5	(.3%)
BLG	1	(.1%)			

PARTY SIZE VS. # INTERVIEWS

BOAT	SHORE
1	1 879
2	2 617
3	3 212
4	4 57
5	5 13
6	6 2
7	7
8	8
9	9
10+	10+

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=5 LAKE :=JONES STATE LAKE
DISTRICT :=24 YEAR :=95
ACREAGE :96 SAMPLING RATIO :=326/738 = 44.1%
NUMBER OF INTERVIEWS:1633

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	4122	3458-4786	(16%)	43	36-50	(16%)	20.31
WKND/HOL	4243	3556-4930	(16%)	44	37-51	(16%)	50.49
STR TOTAL	8365	7427-9303	(11%)	87	77-97	(11%)	35.62
SHORE FISHING:							
WEEKDAY	5856	4855-6857	(17%)	61	51-71	(17%)	21.71
WKND/HOL	5339	4259-6419	(20%)	56	44-67	(20%)	42.06
STR TOTAL	11195	9774-12616	(13%)	117	102-131	(13%)	31.41
BOAT/SHORE COALESCED:							
WEEKDAY	9660	8233-11087	(15%)	101	86-115	(15%)	21.83
WKND/HOL	9318	7878-10758	(15%)	97	82-112	(15%)	47.09
STR TOTAL	18978	17023-20933	(10%)	198	177-218	(10%)	34.23
BOAT/SHORE STRATIFIED:							
WEEKDAY	9980	8808-11152	(12%)	104	92-116	(12%)	21.13
WKND/HOL	9583	8347-10819	(13%)	100	87-113	(13%)	45.79
STR TOTAL	19563	17887-21239	(9%)	204	186-221	(9%)	33.21

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=JONES STATE LAKE
DISTRICT :=24 YEAR :=95
ACREAGE :96 SAMPLING RATIO :=652/1476 = 44.1%
RATIO OF EFFORT HOURS INTERVIEWED := 6496.6/19566.4 = 33.2%
NUMBER OF INTERVIEWS: 1633

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GIS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.406	.176-.635	(57 %)	6914	4403-9425	(36 %)	177.96	72.02
BLG	.621	.455-.787	(27 %)	13785	10990-16581	(20 %)	354.82	143.60
CCF	.206	.158-.254	(23 %)	4905	3235-6574	(34 %)	126.25	51.09
GSF	.034	.020-.047	(40 %)	711	466-957	(35 %)	18.31	7.41
LMB	.470	.362-.579	(23 %)	8629	6937-10320	(20 %)	222.10	89.88
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.101	.021-.181	(79 %)	2045	1496-2594	(27 %)	52.64	21.31
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000		(0 %)	2		(0 %)	.06	.02
TOT	1.838	1.559-2.118	(15 %)	36992	31997-41987	(14 %)	952.14	385.33

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.051	.021-.082	(59 %)	827	531-1124	(36 %)	21.294	119.7
BLG	.020	.015-.024	(25 %)	428	339-516	(21 %)	11.013	31.0
CCF	.080	.059-.100	(25 %)	1764	1277-2250	(28 %)	45.392	359.5
GSF	.002	.001-.003	(40 %)	41	25-58	(39 %)	1.066	58.2
LMB	.173	.130-.216	(25 %)	3159	2547-3771	(19 %)	81.301	366.1
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.019	.006-.032	(68 %)	391	285-497	(27 %)	10.074	191.4
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000		(0 %)			(0 %)	.010	180.0
TOT	.345	.293-.396	(15 %)	6611	5697-7524	(14 %)	170.149	178.7

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.113	.047-.180	(59 %)	1824	1171-2477	(36 %)	18.999	.2638
BLG	.043	.033-.054	(25 %)	943	748-1138	(21 %)	9.825	.0684
CCF	.175	.131-.220	(25 %)	3888	2815-4961	(28 %)	40.498	.7927
GSF	.004	.003-.006	(40 %)	91	56-127	(39 %)	.951	.1284
LMB	.381	.286-.476	(25 %)	6964	5615-8312	(19 %)	72.537	.8070
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.042	.013-.071	(68 %)	863	629-1097	(27 %)	8.988	.4219
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000		(0 %)			(0 %)	.009	.3968
TOT	.760	.646-.873	(15 %)	14574	12559-16588	(14 %)	151.808	.3940

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=JONES STATE LAKE
DISTRICT :=24 YEAR :=95
ACREAGE :96 SAMPLING RATIO :=652/1476 = 44.1%
RATIO OF EFFORT HOURS INTERVIEWED := 6496.6/19566.4 = 33.2%
NUMBER OF INTERVIEWS: 1633

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GZS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.315	.112-.518	(64 %)	5081	3327-6835	(35 %)	130.78	52.93
BLG	.189	.133-.245	(30 %)	4056	2973-5140	(27 %)	104.41	42.26
CCF	.147	.112-.183	(24 %)	3174	2352-3997	(26 %)	81.70	33.07
GSF	.006	.001-.010	(79 %)	161	+-335	(108 %)	4.16	1.68
LMB	.013	.005-.022	(64 %)	340	176-504	(48 %)	8.74	3.54
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.089	.027-.150	(69 %)	1781	1278-2285	(28 %)	45.85	18.56
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.759	.557-.961	(27 %)	14594	12172-17016	(17 %)	375.64	152.02

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.048	.019-.078	(61 %)	751	510-992	(32 %)	19.325	147.8
BLG	.011	.008-.014	(29 %)	237	174-300	(27 %)	6.100	58.4
CCF	.074	.055-.094	(26 %)	1616	1158-2073	(28 %)	41.588	509.0
GSF	.000	.000-.000	(85 %)	14	+-29	(110 %)	.355	85.4
LMB	.009	.003-.016	(73 %)	247	125-368	(49 %)	6.354	726.6
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.018	.006-.031	(69 %)	374	269-480	(28 %)	9.637	210.2
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.162	.129-.194	(20 %)	3239	2677-3801	(17 %)	83.359	221.9

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.106	.041-.171	(61 %)	1655	1124-2187	(32 %)	17.242	.3258
BLG	.024	.017-.031	(29 %)	523	383-662	(27 %)	5.443	.1288
CCF	.164	.121-.207	(26 %)	3562	2554-4570	(28 %)	37.105	1.1222
GSF	.000	.000-.002	(85 %)	30	+-64	(110 %)	.317	.1884
LMB	.021	.006-.036	(73 %)	544	277-812	(49 %)	5.669	1.6019
LOS		*** NOT RECORDED ***			*** NOT RECORDED ***			
RSF	.040	.013-.068	(69 %)	825	594-1057	(28 %)	8.598	.4633
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.357	.285-.428	(20 %)	7140	5901-8379	(17 %)	74.373	.4892

TABLE JONES STATE LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=JONES STATE LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	4.3	4.1 - 4.5	(5%)	.5	13.2	335
SHORE	2.3	2.1 - 2.5	(8%)	.2	13	434
BOAT & SHORE	3.2	3 - 3.3	(5%)	.2	13.2	769

306 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
55.9% OF ALL 1375 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	19.6	16.8 - 22.4	(14%)	1	900	1370
SUCCESS RATING 1-10?	5.4	5.2 - 5.6	(3%)	1	10	1369

IS CATCH ILLEGAL?
CLERK NOTED 14 OUT OF 1375 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	445	(32.4%)	LMB	539	(39.2%)
CRP	73	(5.3%)	CAT	232	(16.9%)
BLG	6	(.4%)	SUN	56	(4.1%)
RSF	2	(.1%)	CCF	10	(.7%)
BLC	12	(.9%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	218	1	389
2	254	2	237
3	43	3	131
4	8	4	47
5	2	5	22
6	3	6	10
7		7	5
8		8	4
9		9	
10+		10+	2

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=5 LAKE :=KINKAID LAKE
DISTRICT :=25 YEAR :=95
ACREAGE :2508 SAMPLING RATIO :=645/2952 = 21.8%
NUMBER OF INTERVIEWS:3028

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	79846	72510-87182	(9%)	32	29-35	(9%)	5.07
WKND/HOL	77640	70772-84508	(9%)	31	28-34	(9%)	8.77
STR TOTAL	157486	147564-167408	(6%)	63	59-67	(6%)	6.89
SHORE FISHING:							
WEEKDAY	3374	2496-4252	(26%)	1	-2	(26%)	5.92
WKND/HOL	2423	1881-2965	(22%)		-1	(22%)	8.70
STR TOTAL	5797	4777-6817	(18%)	2	2-3	(18%)	7.08
BOAT/SHORE COALESCED:							
WEEKDAY	83130	75750-90510	(9%)	33	30-36	(9%)	5.11
WKND/HOL	79976	73044-86908	(9%)	32	29-35	(9%)	8.78
STR TOTAL	163106	153105-173107	(6%)	65	61-69	(6%)	6.91
BOAT/SHORE STRATIFIED:							
WEEKDAY	83220	75837-90603	(9%)	33	30-36	(9%)	5.10
WKND/HOL	80065	73179-86951	(9%)	32	29-35	(9%)	8.77
STR TOTAL	163285	153315-173255	(6%)	65	61-69	(6%)	6.90

```
HARVESTED AND CPUE TABLE          ***  DAY  ***
REGION    :=5              LAKE :=KINKAID LAKE
DISTRICT  :=25             YEAR :=95
ACREAGE   :2508            SAMPLING RATIO :=1290/5904   = 21.8%
RATIO OF EFFORT HOURS INTERVIEWED := 11266.3/163288.5   = 6.89%
NUMBER OF INTERVIEWS: 3028

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4
```

MSC SPECIES CAUGHT:
ORS WAM LOS YEB GSF CAP GOS BLB GZS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.000	+-.000	(331 %)	26	+-106	(314 %)	.03	.01
BLG	.138	.108-.169	(22 %)	39754	32781-46728	(18 %)	39.17	15.85
CCF	.021	.015-.027	(29 %)	3742	2608-4877	(30 %)	3.69	1.49
LMB	.023	.017-.028	(23 %)	7955	6482-9429	(19 %)	7.84	3.17
MUE	.000	+-.002	(304 %)	40	+-122	(207 %)	.04	.02
RSF	.003	.000-.006	(79 %)	1005	292-1718	(71 %)	.99	.40
WAE	.000	+-.000	(328 %)	19	+-59	(208 %)	.02	.00
WHB	.006	.001-.011	(77 %)	1830	+-3879	(112 %)	1.80	.73
WHC	.164	.129-.199	(21 %)	43953	35753-52153	(19 %)	43.30	17.53
MSC	.014	.000-.027	(95 %)	2924	1681-4167	(43 %)	2.88	1.17
TOT	.370	.316-.423	(14 %)	101249	88136-114361	(13 %)	99.75	40.37

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.000	+-.000	(351 %)	6	+-24	(336 %)	.005	215.3
BLG	.013	.010-.015	(22 %)	3815	3149-4481	(17 %)	3.759	96.0
CCF	.015	.008-.023	(49 %)	2597	1745-3448	(33 %)	2.558	693.9
LMB	.009	.007-.012	(26 %)	3184	2546-3822	(20 %)	3.137	400.2
MUE	.002	+-.008	(294 %)	223	+-695	(212 %)	.220	5598.6
RSF	.000	.000-.000	(79 %)	181	54-308	(70 %)	.178	180.1
WAE	.000	+-.000	(343 %)	12	+-39	(219 %)	.012	645.1
WHB	.003	+-.006	(121 %)	676	209-1142	(69 %)	.666	369.4
WHC	.025	.019-.031	(23 %)	7262	5412-9111	(25 %)	7.155	165.2
MSC	.002	.001-.003	(46 %)	1110	+-2232	(101 %)	1.093	379.5
TOT	.070	.059-.081	(16 %)	19064	16366-21762	(14 %)	18.783	188.3

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	+-.000	(351 %)	12	+-53	(336 %)	.005	.4746
BLG	.028	.022-.034	(22 %)	8410	6943-9878	(17 %)	3.353	.2116
CCF	.033	.017-.050	(49 %)	5725	3848-7601	(33 %)	2.283	1.5297
LMB	.021	.015-.026	(26 %)	7019	5612-8426	(20 %)	2.799	.8823
MUE	.004	+-.017	(294 %)	491	+-1532	(212 %)	.196	12.3428
RSF	.001	.000-.002	(79 %)	399	119-679	(70 %)	.159	.3971
WAE	.000	+-.000	(343 %)	27	+-87	(219 %)	.011	1.4221
WHB	.006	+-.013	(121 %)	1490	462-2518	(69 %)	.594	.8143
WHC	.036	.043-.069	(23 %)	16009	11932-20087	(25 %)	6.383	.3642
MSC	.005	.003-.008	(46 %)	2446	+-4920	(101 %)	.975	.8366
TOT	.154	.130-.179	(16 %)	42029	36081-47978	(14 %)	16.758	.4151

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=KINKAID LAKE
DISTRICT :=25 YEAR :=95
ACREAGE :2508 SAMPLING RATIO :=1290/5904 = 21.9%
RATIO OF EFFORT HOURS INTERVIEWED := 11266.3/163288.5 = 6.89%
NUMBER OF INTERVIEWS: 3028

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2
YEAR PERIOD 03/15 TO 04/08 OF SECTION 3
YEAR PERIOD 04/09 TO 04/30 OF SECTION 3
YEAR PERIOD 05/01 TO 05/31 OF SECTION 3
YEAR PERIOD 06/01 TO 06/15 OF SECTION 3
YEAR PERIOD 06/16 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 3
YEAR PERIOD 03/15 TO 04/08 OF SECTION 4
YEAR PERIOD 04/09 TO 04/30 OF SECTION 4
YEAR PERIOD 05/01 TO 05/31 OF SECTION 4
YEAR PERIOD 06/01 TO 06/15 OF SECTION 4
YEAR PERIOD 06/16 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 4

MSC SPECIES CAUGHT:
ORS WAM LOS YEB GSF CAP GOS BLB GZS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	N/HR	95% CI		N CAUGHT	95% CI		N/HA	N/ACRE
BLC	.000	+-.000	(331 %)	26	+-106	(314 %)	.03	.01
BLG	.323	.257-.389	(20 %)	85206	72319-98093	(15 %)	83.95	33.98
CCF	.029	.019-.038	(33 %)	5060	3634-6486	(28 %)	4.99	2.02
LMB	.233	.206-.260	(12 %)	79929	71395-88464	(11 %)	78.75	31.87
MUE	.002	.000-.003	(66 %)	486	299-674	(39 %)	.48	.20
RSF	.004	.000-.007	(78 %)	1400	331-2470	(76 %)	1.38	.56
WAE	.000	+-.000	(120 %)	85	+-175	(106 %)	.08	.04
WHB	.010	.004-.016	(60 %)	2881	+-6360	(121 %)	2.84	1.15
WHC	.218	.175-.261	(20 %)	61916	51014-72817	(18 %)	61.00	24.69
MSC	.058	.043-.073	(26 %)	15568	11903-19233	(24 %)	15.34	6.21
TOT	.878	.794-.961	(10 %)	252357	229001-276113	(9 %)	248.83	100.70

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.000	+-.000	(351 %)	6	+-24	(336 %)	.005	215.3
BLG	.020	.016-.023	(17 %)	5605	4753-6458	(15 %)	5.522	65.8
CCF	.016	.009-.024	(46 %)	2946	1993-3699	(30 %)	2.804	562.4
LMB	.099	.029-.170	(71 %)	32094	28564-35625	(11 %)	31.621	401.5
MUE	.007	.001-.013	(81 %)	1551	911-2192	(41 %)	1.528	3189.6
RSF	.000	.000-.001	(80 %)	218	44-392	(80 %)	.215	155.9
WAE	.000	+-.000	(157 %)	37	-74	(98 %)	.037	433.8
WHB	.004	.000-.006	(84 %)	927	348-1506	(62 %)	.913	321.8
WHC	.029	.022-.035	(23 %)	8457	6320-10594	(25 %)	8.332	136.6
MSC	.008	.005-.011	(36 %)	2243	1098-3388	(51 %)	2.210	144.1
TOT	.183	.146-.220	(20 %)	53985	49126-58843	(9 %)	53.188	213.8

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	+-.000	(351 %)	12	+-53	(336 %)	.005	.4746
BLG	.044	.036-.051	(17 %)	12357	10479-14236	(15 %)	4.927	.1450
CCF	.036	.019-.052	(46 %)	6274	4393-8155	(30 %)	2.502	1.2399
LMB	.219	.064-.374	(71 %)	70755	62971-78539	(11 %)	28.212	.8852
MUE	.015	.003-.028	(81 %)	3420	2008-4832	(41 %)	1.364	7.0319
RSF	.001	.000-.002	(80 %)	481	97-865	(80 %)	.192	.3437
WAE	.000	+-.000	(157 %)	82	1-163	(98 %)	.033	.9674
WHB	.008	.001-.014	(84 %)	2043	767-3320	(62 %)	.815	.7093
WHC	.063	.049-.078	(23 %)	18644	13933-23355	(25 %)	7.434	.3011
MSC	.018	.011-.024	(36 %)	4945	2420-7469	(51 %)	1.972	.3176
TOT	.404	.323-.486	(20 %)	119015	108303-129726	(9 %)	47.454	.4712

TABLE KINKAID LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=KINKAID LAKE CREEL BEGUN IN YEAR=95

SECTION	1	FROM	03/15	TO 04/08
SECTION	1	FROM	04/09	TO 04/30
SECTION	1	FROM	05/01	TO 05/31
SECTION	1	FROM	06/01	TO 06/15
SECTION	1	FROM	06/16	TO 08/31
SECTION	1	FROM	09/01	TO 09/30
SECTION	1	FROM	10/01	TO 10/31
SECTION	1	FROM	11/01	TO 11/15
SECTION	2	FROM	03/15	TO 04/08
SECTION	2	FROM	04/09	TO 04/30
SECTION	2	FROM	05/01	TO 05/31
SECTION	2	FROM	06/01	TO 06/15
SECTION	2	FROM	06/16	TO 08/31
SECTION	2	FROM	09/01	TO 09/30
SECTION	2	FROM	10/01	TO 10/31
SECTION	2	FROM	11/01	TO 11/15
SECTION	3	FROM	03/15	TO 04/08
SECTION	3	FROM	04/09	TO 04/30
SECTION	3	FROM	05/01	TO 05/31
SECTION	3	FROM	06/01	TO 06/15
SECTION	3	FROM	06/16	TO 08/31
SECTION	3	FROM	09/01	TO 09/30
SECTION	3	FROM	10/01	TO 10/31
SECTION	3	FROM	11/01	TO 11/15
SECTION	4	FROM	03/15	TO 04/08
SECTION	4	FROM	04/09	TO 04/30
SECTION	4	FROM	05/01	TO 05/31
SECTION	4	FROM	06/01	TO 06/15
SECTION	4	FROM	06/16	TO 08/31
SECTION	4	FROM	09/01	TO 09/30
SECTION	4	FROM	10/01	TO 10/31
SECTION	4	FROM	11/01	TO 11/15

TABLE KINKAID LAKE 1995 DAY CREEL FINAL REPORT CONTINUED
DAYTIME DATA FOR LAKE=KINKAID LAKE CREEL BEGUN IN YEAR=95

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	4	3.7 - 4.4	(8%)	.3	10.5	210
SHORE	4.3	2.6 - 6	(40%)	1.8	10	10
BOAT & SHORE	4.1	3.7 - 4.4	(8%)	.3	10.5	220

141 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
7.2% OF ALL 3062 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	72.2	69.5 - 74.8	(4%)	0	999	3053
SUCCESS RATING 1-10?	5.7	5.6 - 5.8	(2%)	1	10	3048

IS CATCH ILLEGAL?
CLERK NOTED 9 OUT OF 3062 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	360	(11.8%)	LMB	1413	(46.1%)
CRP	579	(18.9%)	MUE	303	(9.9%)
CAP	8	(.3%)	CCF	186	(6.1%)
WAE	4	(.1%)	BLG	184	(6%)
WHB	19	(.6%)	CAT	5	(.2%)
WHC	1	(0%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	608	1	54
2	1827	2	63
3	384	3	16
4	88	4	6
5	14	5	
6		6	
7	1	7	
8	1	8	
9		9	
10+		10+	

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=2 LAKE :=MONEE RESERVOIR
DISTRICT :=10 YEAR :=95
ACREAGE :46 SAMPLING RATIO :=230/642 = 35.8%
NUMBER OF INTERVIEWS:2355

YEAR PERIOD 04/01 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	2577	1959-3195	(24%)	56	43-69	(24%)	21.24
WKND/HOL	6197	4175-8219	(33%)	135	91-179	(33%)	34.37
STR TOTAL	8774	6925-10623	(21%)	191	151-231	(21%)	30.51
SHORE FISHING:							
WEEKDAY	14841	12887-16795	(13%)	323	280-365	(13%)	20.64
WKND/HOL	14870	12679-17061	(15%)	323	276-371	(15%)	35.35
STR TOTAL	29711	26364-32558	(10%)	646	584-708	(10%)	28.10
BOAT/SHORE COALESCED:							
WEEKDAY	16979	14873-19085	(12%)	369	323-415	(12%)	21.44
WKND/HOL	20708	17163-24253	(17%)	450	373-527	(17%)	35.67
STR TOTAL	37687	33836-41538	(10%)	819	736-903	(10%)	29.26
BOAT/SHORE STRATIFIED:							
WEEKDAY	17420	15379-19461	(12%)	379	334-423	(12%)	20.90
WKND/HOL	21068	18479-23657	(12%)	458	402-514	(12%)	35.06
STR TOTAL	38488	35293-41683	(8%)	837	767-906	(8%)	28.65

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=2 LAKE :=MONEE RESERVOIR
DISTRICT :=10 YEAR :=95
ACREAGE :46 SAMPLING RATIO :=460/1284 = 35.8%
RATIO OF EFFORT HOURS INTERVIEWED := 11026.6/38490.2 = 28.64%
NUMBER OF INTERVIEWS: 2355

COMBINED ACROSS STRATA:

YEAR PERIOD 04/01 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLB	*** NOT RECORDED ***			*** NOT RECORDED ***				
BLC	.022	.006-.039	(74 %)	1091	372-1810	(66 %)	58.61	23.72
BLG	.027	.013-.040	(51 %)	1494	879-2110	(41 %)	80.26	32.48
CCF	.042	.032-.052	(25 %)	1840	1271-2409	(31 %)	98.84	40.00
GSF	.003	+-.006	(103 %)	196	35-357	(82 %)	10.52	4.26
LMB	.092	.073-.110	(20 %)	3693	2977-4408	(19 %)	198.37	80.28
SMB	*** NOT RECORDED ***			*** NOT RECORDED ***				
WAM	.000	+-.000	(179 %)	7	+-19	(161 %)	.39	.16
WHC	.000	+-.000	(189 %)	13	+-34	(325 %)	.68	.28
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.186	.155-.218	(17 %)	8334	6895-9773	(17 %)	447.67	181.17

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLB	*** NOT RECORDED ***			*** NOT RECORDED ***				
BLC	.000	.000-.001	(77 %)	35	13-56	(63 %)	1.859	31.7
BLG	.001	.000-.002	(53 %)	61	37-85	(39 %)	3.269	40.7
CCF	.014	.010-.017	(26 %)	583	341-824	(41 %)	31.295	316.6
GSF	.000	+-.000	(103 %)	6	1-11	(78 %)	.343	32.6
LMB	.026	.019-.033	(28 %)	858	644-1071	(25 %)	46.071	232.3
SMB	*** NOT RECORDED ***			*** NOT RECORDED ***				
WAM	.000	+-.000	(202 %)		+-2	(176 %)	.043	112.4
WHC	.000	+-.000	(185 %)		+-1	(273 %)	.019	28.2
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.041	.033-.050	(20 %)	1543	1225-1862	(21 %)	82.899	185.2

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLB	*** NOT RECORDED ***			*** NOT RECORDED ***				
BLC	.002	.000-.003	(77 %)	76	29-124	(63 %)	1.659	.0699
BLG	.003	.001-.004	(53 %)	134	81-187	(39 %)	2.916	.0898
CCF	.030	.022-.037	(26 %)	1284	752-1817	(41 %)	27.921	.6980
GSF	.000	+-.000	(103 %)	14	3-25	(78 %)	.306	.0720
LMB	.057	.041-.073	(28 %)	1891	1420-2361	(25 %)	41.104	.5120
SMB	*** NOT RECORDED ***			*** NOT RECORDED ***				
WAM	.000	+-.000	(202 %)	2	+-5	(176 %)	.039	.2477
WHC	.000	+-.000	(185 %)		+-3	(273 %)	.017	.0622
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.091	.073-.109	(20 %)	3402	2700-4104	(21 %)	73.963	.4082

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=2 LAKE :=MONEE RESERVOIR
DISTRICT :=10 YEAR :=93
ACREAGE :46 SAMPLING RATIO :=460/1284 = 35.8%
RATIO OF EFFORT HOURS INTERVIEWED := 11026.6/38490.2 = 28.64%
NUMBER OF INTERVIEWS: 2355

COMBINED ACROSS STRATA:

YEAR PERIOD 04/01 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC	.016	.003-.029	(80 %)	708	253-1162	(64 %)	38.01	15.38
BLG	.025	.012-.038	(52 %)	1390	793-1988	(43 %)	74.67	30.22
CCF	.023	.016-.030	(31 %)	1005	445-1565	(56 %)	53.98	21.85
GSF	.003	+-.006	(103 %)	194	33-356	(83 %)	10.44	4.23
LMB	.000	.000-.001	(61 %)	42	20-63	(52 %)	2.23	.91
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM	.000	+-.000	(179 %)	7	+-19	(161 %)	.39	.16
WHC	.000	+-.000	(189 %)	13	+-54	(325 %)	.68	.28
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.068	.045-.090	(33 %)	3358	2447-4270	(27 %)	180.41	73.01

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC	.000	.000-.001	(84 %)	27	8-45	(69 %)	1.425	37.5
BLG	.001	.000-.002	(54 %)	59	35-83	(41 %)	3.151	42.2
CCF	.008	.005-.011	(33 %)	367	87-647	(76 %)	19.715	365.2
GSF	.000	+-.000	(103 %)	6	1-11	(78 %)	.342	32.7
LMB	.000	.000-.001	(69 %)	32	13-51	(59 %)	1.722	770.9
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM	.000	+-.000	(202 %)		+-2	(176 %)	.043	112.4
WHC	.000	+-.000	(185 %)		+-1	(273 %)	.019	28.2
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.011	.008-.014	(27 %)	492	219-765	(55 %)	26.418	146.4

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC	.001	.000-.003	(84 %)	38	18-99	(69 %)	1.272	.0827
BLG	.002	.001-.004	(54 %)	129	77-182	(41 %)	2.811	.0930
CCF	.018	.012-.024	(33 %)	809	192-1427	(76 %)	17.590	.8051
GSF	.000	+-.000	(103 %)	14	3-25	(78 %)	.305	.0722
LMB	.002	.000-.003	(69 %)	71	29-112	(59 %)	1.537	1.6995
SMB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WAM	.000	+-.000	(202 %)	2	+-5	(176 %)	.039	.2477
WHC	.000	+-.000	(185 %)		+-3	(273 %)	.017	.0622
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.024	.017-.030	(27 %)	1084	483-1686	(55 %)	23.570	.3228

TABLE MONEE RESERVOIR 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=MONEE RESERVOIR CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 03/31
SECTION 1 FROM 04/01 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF. INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	3.8	3.6 - 4.1	(6%)	.3	12.8	322
SHORE	2.6	2.5 - 2.7	(3%)	.2	11	1203
BOAT & SHORE	2.8	2.8 - 2.9	(3%)	.2	12.8	1525

620 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
86.6% OF ALL 1760 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF. INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	12.8	12.3 - 13.3	(4%)	1	200	1754
SUCCESS RATING 1-10?	4.1	4 - 4.3	(3%)	1	10	1705

IS CATCH ILLEGAL?
CLERK NOTED 4 OUT OF 1760 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	1250	(71%)	BSS	196	(11.1%)
CRP	22	(1.3%)	SUN	6	(.3%)
BLG	72	(4.1%)	CAT	36	(2%)
LMB	49	(2.8%)	CCF	116	(6.6%)
BLC	13	(.7%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT	SHORE
1	38	448
2	193	538
3	76	248
4	20	124
5		40
6	1	22
7		3
8		3
9		2
10+		4

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=5 LAKE :=NEWTON LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :1755 SAMPLING RATIO :=260/738 = 35.2%
NUMBER OF INTERVIEWS:1621

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	38597	33873-43321	(12%)	22	19-25	(12%)	8.12
WKND/HOL	37228	31536-42920	(15%)	21	18-24	(15%)	17.66
STR TOTAL	75825	69123-82527	(9%)	43	39-47	(9%)	12.81
SHORE FISHING:							
WEEKDAY	4977	4682-5272	(6%)	3	3-3	(6%)	1.14
WKND/HOL	2798	2459-3137	(12%)	2	1-2	(12%)	7.19
STR TOTAL	7775	7355-8195	(5%)	4	4-5	(5%)	3.32
BOAT/SHORE COALESCED:							
WEEKDAY	43569	38854-48284	(11%)	25	22-28	(11%)	7.33
WKND/HOL	39991	34252-45730	(14%)	23	20-26	(14%)	16.95
STR TOTAL	83560	76814-90306	(8%)	48	44-51	(8%)	11.93
BOAT/SHORE STRATIFIED:							
WEEKDAY	43576	38845-48307	(11%)	25	22-28	(11%)	7.32
WKND/HOL	40027	34330-45724	(14%)	23	20-26	(14%)	16.93
STR TOTAL	83603	76890-90316	(8%)	48	44-51	(8%)	11.92

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=NEWTON LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :1755 SAMPLING RATIO :=520/1476 = 35.2%
RATIO OF EFFORT HOURS INTERVIEWED := 9968.5/83605.6 = 11.92%
NUMBER OF INTERVIEWS: 1821

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLG	.015	.004-.026	(71 %)	668	251-1085	(62 %)	.94	.38
CAP	.000	+-.001	(133 %)	58	+-125	(113 %)	.08	.04
CCF	.277	.204-.351	(26 %)	35128	27790-42465	(21 %)	49.46	20.02
LMB	.303	.260-.345	(14 %)	47273	40826-53720	(14 %)	66.56	26.94
WAM	.000	+-.000	(257 %)	5	+-17	(257 %)	.00	.00
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.596	.517-.674	(13 %)	83131	72996-93267	(12 %)	117.05	47.37

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLG	.000	.000-.000	(72 %)	23	9-37	(63 %)	.032	34.1
CAP	.000	+-.001	(138 %)	42	+-90	(118 %)	.058	710.7
CCF	.063	.047-.079	(25 %)	8572	6362-10782	(26 %)	12.069	244.0
LMB	.231	.199-.263	(14 %)	38400	33391-43409	(13 %)	54.065	812.3
WAM	.000	+-.000	(257 %)		+-2	(257 %)	.000	96.7
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.295	.261-.329	(11 %)	47036	41303-52770	(12 %)	66.225	565.8

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLG	.001	.000-.002	(72 %)	50	19-82	(63 %)	.029	.0751
CAP	.001	+-.003	(138 %)	92	+-199	(118 %)	.052	1.5667
CCF	.139	.104-.174	(25 %)	18897	14025-23769	(26 %)	10.768	.5380
LMB	.509	.438-.579	(14 %)	84656	73614-95699	(13 %)	48.237	1.7908
WAM	.000	+-.000	(257 %)	1	+-4	(257 %)	.000	.2131
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.650	.576-.723	(11 %)	103696	91057-116336	(12 %)	59.086	1.2474

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=NEWTON LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :1755 SAMPLING RATIO :=520/1476 = 35.2%
RATIO OF EFFORT HOURS INTERVIEWED := 9968.5/83605.6 = 11.92%
NUMBER OF INTERVIEWS: 1821

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLG	.005	+-.014	(163 %)	251	+-570	(127 %)	.35	.15
CAP	.000	+-.001	(151 %)	36	+-84	(135 %)	.05	.02
CCF	.126	.094-.158	(26 %)	18088	13102-23073	(28 %)	25.47	10.31
LMB	.005	.003-.006	(40 %)	811	442-1180	(46 %)	1.14	.46
WAM	.000	+-.000	(257 %)	5	+-17	(257 %)	.00	.00
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.136	.103-.170	(24 %)	19190	14131-24250	(26 %)	27.02	10.94

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG.WT(G)
BLG	.000	+-.000	(190 %)	8	+-19	(132 %)	.011	32.3
CAP	.000	+-.001	(178 %)	26	+-64	(146 %)	.037	725.7
CCF	.047	.034-.060	(28 %)	6869	4858-8881	(29 %)	9.672	379.8
LMB	.009	.005-.012	(41 %)	1537	842-2233	(45 %)	2.165	1895.9
WAM	.000	+-.000	(257 %)		+-2	(257 %)	.000	96.7
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.056	.043-.070	(24 %)	8441	6271-10611	(26 %)	11.885	439.9

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLG	.000	+-.001	(190 %)	18	+-42	(132 %)	.010	.0713
CAP	.000	+-.003	(178 %)	58	+-141	(146 %)	.033	1.6000
CCF	.104	.075-.133	(28 %)	15144	10710-19579	(29 %)	8.629	.8373
LMB	.019	.011-.027	(41 %)	3389	1855-4923	(45 %)	1.931	4.1798
WAM	.000	+-.000	(257 %)	1	+-4	(257 %)	.000	.2131
MSC	*** NOT RECORDED ***			*** NOT RECORDED ***				
TOT	.124	.094-.154	(24 %)	18610	13826-23394	(26 %)	10.604	.9698

TABLE NEWTON LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=NEWTON LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	5.6	5.5 - 5.7	(2%)	.7	13.1	1049
SHORE	2.2	1.3 - 3.1	(42%)	1	4	9
BOAT & SHORE	5.6	5.5 - 5.7	(2%)	.7	13.1	1058

878 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
93.7% OF ALL 1129 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	45.7	43.3 - 48.1	(5%)	1	322	1115
SUCCESS RATING 1-10?	5.6	5.4 - 5.7	(2%)	1	10	1089

IS CATCH ILLEGAL?
CLERK NOTED 13 OUT OF 1129 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	49 (4.3%)	LMB	883 (78.2%)
CCF	197 (17.4%)		

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	243	1	18
2	754	2	23
3	53	3	16
4	6	4	4
5		5	1
6		6	1
7		7	
8		8	
9		9	
10+		10+	

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=4 LAKE :=OTTER LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :765 SAMPLING RATIO :=410/1431 = 28.6%
NUMBER OF INTERVIEWS:1728

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	16004	14051-17957	(12%)	21	18-23	(12%)	10.80
WKND/HOL	19558	17652-21464	(10%)	26	23-28	(10%)	26.13
STR TOTAL	35562	32874-38250	(8%)	46	43-50	(8%)	19.23
SHORE FISHING:							
WEEKDAY	1304	814-1794	(38%)	2	1-2	(38%)	9.11
WKND/HOL	1164	808-1520	(31%)	2	1-2	(31%)	15.14
STR TOTAL	2468	1874-3062	(24%)	3	2-4	(24%)	11.96
BOAT/SHORE COALESCED:							
WEEKDAY	17183	15143-19223	(12%)	22	20-25	(12%)	10.75
WKND/HOL	20654	18586-22722	(10%)	27	24-30	(10%)	25.59
STR TOTAL	37837	34983-40691	(8%)	49	46-53	(8%)	18.85
BOAT/SHORE STRATIFIED:							
WEEKDAY	17310	15305-19315	(12%)	23	20-25	(12%)	10.67
WKND/HOL	20724	18790-22658	(9%)	27	25-30	(9%)	25.51
STR TOTAL	38034	35288-40780	(7%)	50	46-53	(7%)	18.75

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=OTTER LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :765 SAMPLING RATIO :=820/2862 = 28.6%
RATIO OF EFFORT HOURS INTERVIEWED := 7132.6/38037.3 = 18.75%
NUMBER OF INTERVIEWS: 1728

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1 .
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2

MSC SPECIES CAUGHT:
GSF CAP BGH
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLG	.087	.047-.126	(45 %)	5405	3560-7249	(34 %)	17.46	7.07
CCF	.006	.001-.010	(76 %)	363	173-554	(52 %)	1.17	.48
LMB	.007	.005-.010	(37 %)	670	428-911	(36 %)	2.16	.88
MUE	.000	+-.000	(283 %)	12	+-34	(177 %)	.04	.02
SBH	.000	+-.000	(236 %)	3	+-10	(237 %)	.00	.00
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.189	.067-.312	(65 %)	10726	7479-13973	(30 %)	34.64	14.02
YEB	.000	+-.000	(113 %)	65	+-141	(116 %)	.21	.09
MSC	.000	+-.001	(115 %)	46	+-117	(152 %)	.15	.06
TOT	.290	.167-.413	(42 %)	17290	13548-21032	(22 %)	55.85	22.60

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLG	.007	.004-.010	(44 %)	483	298-667	(38 %)	1.560	89.3
CCF	.003	.001-.005	(61 %)	231	121-341	(48 %)	.746	636.1
LMB	.011	.007-.015	(37 %)	1013	615-1411	(39 %)	3.272	1512.8
MUE	.000	+-.001	(280 %)	22	+-59	(175 %)	.070	1733.0
SBH	.000	+-.000	(237 %)	15	+-49	(237 %)	.047	5049.2
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.020	.003-.036	(82 %)	1135	772-1498	(32 %)	3.666	105.8
YEB	.000	+-.000	(108 %)	23	+-47	(105 %)	.074	352.4
MSC	.000	+-.000	(120 %)	23	+-57	(146 %)	.075	498.5
TOT	.042	.027-.057	(36 %)	2944	2379-3509	(19 %)	9.509	170.3

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLG	.015	.009-.022	(44 %)	1065	658-1471	(38 %)	1.392	.1970
CCF	.007	.003-.012	(61 %)	509	266-753	(48 %)	.666	1.4024
LMB	.024	.015-.033	(37 %)	2233	1356-3111	(39 %)	2.920	3.3350
MUE	.000	+-.003	(280 %)	47	+-131	(175 %)	.062	3.8206
SBH	.000	+-.000	(236 %)	32	+-108	(237 %)	.042	11.1315
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHC	.043	.008-.078	(82 %)	2502	1701-3303	(32 %)	3.270	.2333
YEB	.000	+-.000	(108 %)	51	+-104	(105 %)	.066	.7770
MSC	.000	+-.001	(120 %)	51	+-125	(146 %)	.067	1.0991
TOT	.092	.059-.125	(36 %)	6490	5245-7735	(19 %)	8.484	.3754

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=OTTER LAKE
DISTRICT :=18 YEAR :=95
ACREAGE :765 SAMPLING RATIO :=820/2862 = 28.6%
RATIO OF EFFORT HOURS INTERVIEWED := 7132.6/38037.3 = 18.75%
NUMBER OF INTERVIEWS: 1728

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 2
YEAR PERIOD 04/09 TO 04/30 OF SECTION 2
YEAR PERIOD 05/01 TO 05/31 OF SECTION 2
YEAR PERIOD 06/01 TO 06/15 OF SECTION 2
YEAR PERIOD 06/16 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 11/01 TO 11/15 OF SECTION 2

MSC SPECIES CAUGHT:
GSF CAP BGH
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLG	.211	.147-.275	(30 %)	11719	8410-15028	(28 %)	37.85	15.32
CCF	.010	.004-.017	(64 %)	678	366-990	(46 %)	2.19	.89
LMB	.137	.116-.157	(15 %)	10177	8863-11491	(13 %)	32.87	13.30
MUE	.003	.001-.005	(58 %)	227	130-324	(43 %)	.73	.30
SBH	.009	.005-.013	(44 %)	762	425-1099	(44 %)	2.46	1.00
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB	.002	+-.023	(127 %)	138	+-1885	(127 %)	.44	.18
WHC	.377	.253-.501	(33 %)	23659	18659-28659	(21 %)	76.42	30.93
YEB	.004	.000-.007	(90 %)	240	81-398	(66 %)	.77	.32
MSC	.006	+-.013	(111 %)	428	6-850	(99 %)	1.38	.56
TOT	.759	.617-.902	(19 %)	48026	41540-54512	(14 %)	155.12	62.78

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLG	.013	.009-.017	(33 %)	751	532-969	(29 %)	2.425	64.1
CCF	.004	.002-.006	(53 %)	295	176-415	(40 %)	.954	435.7
LMB	.075	.061-.088	(18 %)	5760	4870-6649	(15 %)	18.604	566.0
MUE	.006	.003-.009	(49 %)	462	268-655	(42 %)	1.491	2035.0
SBH	.005	.003-.008	(46 %)	438	224-652	(49 %)	1.416	575.0
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB	.000	+-.002	(127 %)	11	+-156	(127 %)	.037	83.0
WHC	.026	.010-.042	(61 %)	1548	1151-1945	(26 %)	5.000	65.4
YEB	.000	+-.002	(117 %)	55	22-89	(61 %)	.179	231.1
MSC	.000	.000-.001	(69 %)	59	14-105	(77 %)	.191	138.1
TOT	.131	.112-.150	(15 %)	9379	8277-10482	(12 %)	30.295	195.3

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLG	.029	.019-.038	(33 %)	1655	1174-2136	(29 %)	2.163	.1412
CCF	.009	.004-.014	(53 %)	651	388-914	(40 %)	.851	.9606
LMB	.164	.135-.194	(18 %)	12698	10737-14658	(15 %)	16.599	1.2477
MUE	.013	.007-.019	(49 %)	1017	591-1444	(42 %)	1.330	4.4864
SBH	.011	.006-.017	(46 %)	966	495-1438	(49 %)	1.263	1.2677
STB		*** NOT RECORDED ***			*** NOT RECORDED ***			
WHB	.000	+-.004	(127 %)	25	+-345	(127 %)	.033	.1829
WHC	.057	.023-.092	(61 %)	3412	2537-4288	(26 %)	4.461	.1442
YEB	.002	+-.004	(117 %)	122	48-196	(61 %)	.160	.5096
MSC	.001	.000-.002	(69 %)	130	30-231	(77 %)	.170	.3045
TOT	.288	.246-.330	(15 %)	20678	18247-23108	(12 %)	27.030	.4306

TABLE OTTER LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=OTTER LAKE CREEL BEGUN IN YEAR=95

SECTION 1	FROM	03/15	TO 04/08
SECTION 1	FROM	04/09	TO 04/30
SECTION 1	FROM	05/01	TO 05/31
SECTION 1	FROM	06/01	TO 06/15
SECTION 1	FROM	06/16	TO 08/31
SECTION 1	FROM	09/01	TO 09/30
SECTION 1	FROM	10/01	TO 10/31
SECTION 2	FROM	03/15	TO 04/08
SECTION 2	FROM	04/09	TO 04/30
SECTION 2	FROM	05/01	TO 05/31
SECTION 2	FROM	06/01	TO 06/15
SECTION 2	FROM	06/16	TO 08/31
SECTION 2	FROM	09/01	TO 09/30
SECTION 2	FROM	10/01	TO 10/31
SECTION 2	FROM	11/01	TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN	MIN.	MAX.	#SAMPLES
BOAT	4.2	4 - 4.4 (4%)	.4	13	553
SHORE	1.7	1.4 - 2 (16%)	.6	3.7	35
BOAT & SHORE	4.1	3.9 - 4.2 (4%)	.4	13	588

382 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
41.9% OF ALL 1403 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN	MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	25	23.5 - 26.5 (6%)	0	360	1388
SUCCESS RATING 1-10?	4.6	4.5 - 4.8 (4%)	1	10	1349

IS CATCH ILLEGAL?
CLERK NOTED 6 OUT OF 1403 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	122 (8.7%)	WHC	151 (10.8%)
LMB	732 (52.2%)	CCF	67 (4.8%)
MUE	118 (8.4%)	BSS	7 (.5%)
CAP	3 (.2%)	CRP	119 (8.5%)
BLG	62 (4.4%)	SBH	21 (1.5%)
RSF	1 (.1%)		

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	414	1	21
2	787	2	32
3	97	3	9
4	28	4	12
5	1	5	
6	2	6	
7		7	
8		8	
9		9	
10+		10+	

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=1 LAKE :=POWERTON LAKE
DISTRICT :=06 YEAR :=95
ACREAGE :1289 SAMPLING RATIO :=338/720 = 46.9%
NUMBER OF INTERVIEWS:4388

YEAR PERIOD 02/16 TO 03/14 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/12 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	16246	14078-18414	(13%)	13	11-14	(13%)	15.48
WKND/HOL	17252	15454-19050	(10%)	13	12-15	(10%)	35.45
STR TOTAL	33498	30736-36260	(8%)	26	24-28	(8%)	25.76
SHORE FISHING:							
WEEKDAY	17853	16119-19587	(10%)	14	13-15	(10%)	18.82
WKND/HOL	18904	17249-20559	(9%)	15	13-16	(9%)	31.84
STR TOTAL	36757	34386-39128	(6%)	29	27-30	(6%)	25.52
BOAT/SHORE COALESCED:							
WEEKDAY	33750	30156-37344	(11%)	26	23-29	(11%)	17.41
WKND/HOL	35884	32673-39095	(9%)	28	25-30	(9%)	33.82
STR TOTAL	69634	64897-74371	(7%)	54	50-58	(7%)	25.86
BOAT/SHORE STRATIFIED:							
WEEKDAY	34102	31353-36851	(8%)	26	24-29	(8%)	17.23
WKND/HOL	36159	33766-38552	(7%)	28	26-30	(7%)	33.56
STR TOTAL	70261	66647-73875	(5%)	55	52-57	(5%)	25.63

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=1 LAKE :=FOWERTON LAKE
DISTRICT :=06 YEAR :=95
ACREAGE :1289 SAMPLING RATIO :=676/1440 = 46.9%
RATIO OF EFFORT HOURS INTERVIEWED := 18009/70263.8 = 25.63%
NUMBER OF INTERVIEWS: 4388

COMBINED ACROSS STRATA:

YEAR PERIOD 02/16 TO 03/14 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/12 OF SECTION 1

MSC SPECIES CAUGHT:
FRD CAP GSF BGB BKB FCF SAB BLB LOG YEB NOP BGH
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.000	+-.000	(188 %)	4	+-10	(160 %)	.00	.00
BLG	.123	.084-.163	(32 %)	6392	5045-7739	(21 %)	12.25	4.96
CCF	.295	.259-.330	(12 %)	20242	17955-22528	(11 %)	38.80	15.71
LMB	.005	.003-.008	(47 %)	469	241-697	(49 %)	.90	.37
SAR	.009	+-.028	(198 %)	417	48-785	(88 %)	.80	.33
SMB	.249	.210-.287	(16 %)	16672	14878-18466	(11 %)	31.96	12.94
WAE	.061	.046-.076	(25 %)	4458	3600-5317	(19 %)	8.55	3.46
WHB	.138	.109-.168	(22 %)	8477	6940-10013	(18 %)	16.25	6.58
WHC	.000	+-.002	(194 %)	22	+-58	(168 %)	.04	.02
MSC	.117	.080-.154	(32 %)	6216	5065-7367	(19 %)	11.92	4.82
TOT	.999	.909-1.089	(9 %)	63368	58874-67863	(7 %)	121.47	49.16

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.000	+-.000	(174 %)	1	+-3	(152 %)	.003	358.6
BLG	.006	.004-.008	(33 %)	345	269-420	(22 %)	.661	53.9
CCF	.101	.085-.117	(16 %)	7037	6127-7946	(13 %)	13.489	347.6
LMB	.002	.000-.004	(58 %)	186	113-259	(39 %)	.357	396.9
SAR	.030	+-.081	(166 %)	1584	482-2686	(70 %)	3.037	3803.5
SMB	.168	.138-.198	(18 %)	11728	10081-13075	(11 %)	22.482	703.4
WAE	.042	.031-.053	(26 %)	3127	2537-3718	(19 %)	5.995	701.4
WHB	.040	.030-.050	(25 %)	2715	2160-3270	(20 %)	5.205	320.3
WHC	.000	+-.000	(241 %)	7	+-22	(213 %)	.013	324.1
MSC	.046	.034-.059	(27 %)	3713	2883-4544	(22 %)	7.118	597.4
TOT	.437	.381-.493	(13 %)	30444	27969-32918	(8 %)	58.359	480.4

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	+-.000	(174 %)	3	+-7	(152 %)	.002	.7906
BLG	.014	.009-.019	(33 %)	760	593-927	(22 %)	.589	.1189
CCF	.222	.187-.258	(16 %)	15513	13507-17518	(13 %)	12.035	.7664
LMB	.005	.002-.008	(58 %)	410	250-570	(39 %)	.318	.8749
SAR	.067	+-.178	(166 %)	3493	1063-5922	(70 %)	2.710	8.3852
SMB	.370	.305-.436	(18 %)	25856	22886-28825	(11 %)	20.059	1.5508
WAE	.093	.069-.117	(26 %)	6894	5592-8196	(19 %)	5.348	1.5464
WHB	.089	.067-.111	(25 %)	5986	4762-7210	(20 %)	4.644	.7062
WHC	.000	+-.002	(241 %)	15	+-48	(213 %)	.012	.7146
MSC	.102	.075-.130	(27 %)	8187	6356-10018	(22 %)	6.351	1.3169
TOT	.963	.839-1.087	(13 %)	67116	61661-72571	(8 %)	52.068	1.0591

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=1 LAKE :=POWERTON LAKE
DISTRICT :=06 YEAR :=93
ACREAGE :1289 SAMPLING RATIO :=676/1440 = 46.9%
RATIO OF EFFORT HOURS INTERVIEWED := 18009/70263.8 = 25.63%
NUMBER OF INTERVIEWS: 4388

COMBINED ACROSS STRATA:

YEAR PERIOD 02/16 TO 03/14 OF SECTION 1
YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/12 OF SECTION 1

MSC SPECIES CAUGHT:
FRD CAP GSF BGB BKB FCF SAB BLB LOG YEB NOP BGH
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.000	+-.000	(188 %)	4	+-10	(160 %)	.00	.00
BLG	.021	.010-.033	(55 %)	1231	796-1705	(36 %)	2.40	.97
CCF	.116	.100-.133	(14 %)	9048	7933-10164	(12 %)	17.35	7.02
LMB	.000	+-.000	(223 %)	6	+-20	(223 %)	.01	.00
SAR	*** NOT RECORDED ***			*** NOT RECORDED ***				
SMB	.005	.003-.006	(39 %)	370	243-496	(34 %)	.71	.29
WAE	.001	.000-.002	(76 %)	78	32-123	(58 %)	.15	.06
WHB	.048	.033-.063	(32 %)	3587	2640-4533	(26 %)	6.88	2.78
WHC	.000	+-.000	(226 %)	2	+-8	(226 %)	.00	.00
MSC	.027	.016-.039	(41 %)	1662	1141-2183	(31 %)	3.19	1.29
TOT	.219	.190-.248	(13 %)	16007	14265-17750	(11 %)	30.69	12.42

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.000	+-.000	(174 %)	1	+-3	(152 %)	.003	358.6
BLG	.002	.000-.004	(61 %)	132	83-182	(37 %)	.253	105.7
CCF	.060	.051-.070	(16 %)	4604	3993-5216	(13 %)	8.826	508.8
LMB	.000	+-.000	(223 %)	5	+-15	(223 %)	.009	737.9
SAR	*** NOT RECORDED ***			*** NOT RECORDED ***				
SMB	.005	.003-.007	(39 %)	464	308-619	(33 %)	.889	1254.1
WAE	.003	.000-.005	(89 %)	156	69-243	(56 %)	.299	2011.6
WHB	.021	.013-.028	(38 %)	1556	1094-2018	(30 %)	2.982	433.7
WHC	.000	+-.000	(226 %)		+-3	(226 %)	.002	341.2
MSC	.016	.010-.021	(35 %)	1700	1057-2342	(38 %)	3.258	1022.7
TOT	.107	.092-.122	(14 %)	8618	7497-9739	(13 %)	16.521	538.4

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.000	+-.000	(174 %)	3	+-7	(152 %)	.002	.7906
BLG	.005	.002-.008	(61 %)	291	183-400	(37 %)	.226	.2330
CCF	.133	.112-.155	(16 %)	10150	8802-11498	(13 %)	7.875	1.1218
LMB	.000	+-.000	(223 %)	10	+-33	(223 %)	.008	1.6267
SAR	*** NOT RECORDED ***			*** NOT RECORDED ***				
SMB	.012	.007-.016	(39 %)	1022	680-1365	(33 %)	.793	2.7648
WAE	.006	.000-.011	(89 %)	344	153-535	(56 %)	.267	4.4347
WHB	.046	.028-.063	(38 %)	3430	2412-4448	(30 %)	2.661	.9562
WHC	.000	+-.000	(226 %)	2	+-6	(226 %)	.001	.7523
MSC	.034	.022-.046	(35 %)	3747	2331-5163	(38 %)	2.907	2.2546
TOT	.236	.204-.269	(14 %)	19000	16528-21471	(13 %)	14.740	1.1869

TABLE POWERTON LAKE 1995 DAY CREEL FINAL REPORT
DAYTIME DATA FOR LAKE=POWERTON LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 02/16 TO 03/14
SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/12

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF. INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	3.9	3.8 - 4	(3%)	.5	13.9	1172
SHORE	3.1	3 - 3.1	(3%)	.3	12.9	1652
BOAT & SHORE	3.4	3.3 - 3.5	(2%)	.3	13.9	2824

1434 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
89.8% OF ALL 3144 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF. INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	17.5	16.5 - 18.6	(6%)	1	900	3139
SUCCESS RATING 1-10?	3.8	3.7 - 3.9	(3%)	1	10	3097

IS CATCH ILLEGAL?
CLERK NOTED 36 OUT OF 3144 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	946 (30.1%)	WHB	219 (7%)		
WAE	124 (3.9%)	SMB	831 (26.4%)		
CCF	686 (21.8%)	CAT	202 (6.4%)		
BSS	69 (2.2%)	LMB	15 (.5%)		
BLG	34 (1.1%)	CRP	6 (.2%)		
CAP	3 (.1%)	BLC	1 (0%)		
FCF	6 (.2%)	GSF	2 (.1%)		

PARTY SIZE VS. # INTERVIEWS

BOAT		SHORE	
1	247	1	829
2	796	2	814
3	152	3	219
4	19	4	55
5	1	5	6
6	1	6	3
7		7	1
8		8	
9		9	
10+		10+	1

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=4 LAKE :=RANDOLPH COUNTY LAKE
DISTRICT :=21 YEAR :=95
ACREAGE :78 SAMPLING RATIO :=312/738 = 42.2%
NUMBER OF INTERVIEWS:1718

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	5809	4811-6807	(17%)	74	62-87	(17%)	17.58
WKND/HOL	7292	6491-8093	(11%)	93	83-104	(11%)	45.13
STR TOTAL	13101	11833-14369	(10%)	168	152-184	(10%)	32.91
SHORE FISHING:							
WEEKDAY	5122	4372-5872	(15%)	66	56-75	(15%)	13.65
WKND/HOL	5692	4783-6601	(16%)	73	61-85	(16%)	26.69
STR TOTAL	10814	9656-11972	(11%)	139	124-153	(11%)	20.51
BOAT/SHORE COALESCED:							
WEEKDAY	10695	9297-12093	(13%)	137	119-155	(13%)	16.09
WKND/HOL	12759	11261-14257	(12%)	164	144-183	(12%)	37.70
STR TOTAL	23454	21437-25471	(9%)	301	275-327	(9%)	27.84
BOAT/SHORE STRATIFIED:							
WEEKDAY	10933	9696-12170	(11%)	140	124-156	(11%)	15.74
WKND/HOL	12986	11792-14180	(9%)	166	151-182	(9%)	37.04
STR TOTAL	23919	22214-25624	(7%)	307	285-329	(7%)	27.30

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=RANDOLPH COUNTY LAKE
DISTRICT :=21 YEAR :=95
ACREAGE :78 SAMPLING RATIO :=624/1476 = 42.2%
RATIO OF EFFORT HOURS INTERVIEWED := 6530/23922.4 = 27.29%
NUMBER OF INTERVIEWS: 1718

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GSF SMB BLB GOS CAP
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLC	.039	+-.083	(113 %)	1781	+-3749	(110 %)	56.42	22.83
BLG	.787	.636-.937	(19 %)	25254	20883-29625	(17 %)	800.02	323.77
CCF	.096	.052-.139	(45 %)	2352	1836-2869	(22 %)	74.52	30.16
LMB	.264	.208-.319	(21 %)	6824	5650-7998	(17 %)	216.17	87.49
RBT	.099	.072-.125	(27 %)	2872	1763-3982	(39 %)	91.00	36.83
RSF	.158	.119-.196	(24 %)	5386	4184-6588	(22 %)	170.61	69.05
WAE	.010	+-.022	(119 %)	238	91-384	(62 %)	7.53	3.05
WAM	.005	+-.015	(189 %)	85	10-161	(89 %)	2.70	1.10
WHC	.017	.003-.030	(80 %)	371	159-582	(57 %)	11.74	4.75
MSC	.038	.014-.062	(63 %)	727	343-1110	(53 %)	23.02	9.32
TOT	1.511	1.306-1.716	(14 %)	45890	39361-52419	(14 %)	1453.74	588.32

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLC	.006	+-.013	(114 %)	250	+-556	(123 %)	7.906	140.1
BLG	.057	.042-.073	(27 %)	1778	1425-2130	(20 %)	56.316	70.4
CCF	.042	.015-.069	(65 %)	865	679-1052	(22 %)	27.417	367.7
LMB	.058	.042-.074	(27 %)	1449	1185-1714	(18 %)	45.919	212.4
RBT	.030	.021-.039	(29 %)	869	516-1221	(41 %)	27.524	302.5
RSF	.016	.012-.020	(27 %)	519	405-632	(22 %)	16.427	96.3
WAE	.002	.000-.003	(76 %)	56	30-82	(47 %)	1.767	234.7
WAM	.000	+-.001	(183 %)	5	-10	(94 %)	.160	59.0
WHC	.003	.000-.005	(81 %)	58	21-95	(64 %)	1.845	157.2
MSC	.002	.000-.003	(56 %)	43	23-62	(47 %)	1.347	58.5
TOT	.216	.183-.249	(15 %)	5891	5103-6679	(13 %)	186.625	128.4

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLC	.013	+-.028	(114 %)	550	+-1227	(123 %)	7.053	.3089
BLG	.126	.092-.161	(27 %)	3919	3142-4696	(20 %)	50.245	.1552
CCF	.092	.032-.152	(65 %)	1908	1496-2320	(22 %)	24.461	.8110
LMB	.127	.093-.162	(27 %)	3196	2613-3778	(18 %)	40.969	.4683
RBT	.066	.047-.085	(29 %)	1915	1139-2692	(41 %)	24.557	.6668
RSF	.035	.026-.045	(27 %)	1143	893-1394	(22 %)	14.656	.2123
WAE	.004	.000-.007	(76 %)	123	65-181	(47 %)	1.576	.5173
WAM	.000	+-.002	(183 %)	11	-22	(94 %)	.142	.1301
WHC	.006	.001-.011	(81 %)	128	47-210	(64 %)	1.646	.3465
MSC	.005	.002-.008	(56 %)	94	50-138	(47 %)	1.202	.1290
TOT	.476	.402-.550	(15 %)	12988	11250-14725	(13 %)	166.507	.2830

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=4 LAKE :=RANDOLPH COUNTY LAKE
DISTRICT :=21 YEAR :=95
ACREAGE :78 SAMPLING RATIO :=624/1476 = 42.2%
RATIO OF EFFORT HOURS INTERVIEWED := 6530/23922.4 = 27.29%
NUMBER OF INTERVIEWS: 1718

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GSF SMB BLB GOS CAP
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLC	.032	+-.078	(143 %)	1542	+-3504	(127 %)	48.86	19.78
BLG	.337	.225-.449	(33 %)	11029	8299-13759	(25 %)	349.39	141.40
CCF	.070	.026-.114	(63 %)	1541	1177-1905	(24 %)	48.82	19.76
LMB	.012	.004-.020	(65 %)	333	208-458	(37 %)	10.55	4.27
RBT	.081	.057-.105	(29 %)	2239	1316-3163	(41 %)	70.94	28.71
RSF	.097	.066-.127	(32 %)	2779	2157-3401	(22 %)	88.03	35.63
WAE	.002	+-.006	(171 %)	56	17-95	(69 %)	1.79	.72
WAM	.000		(0 %)	2		(0 %)	.07	.03
WHC	.016	.003-.029	(83 %)	306	105-507	(66 %)	9.68	3.92
MSC	.009	.002-.015	(72 %)	265	65-465	(76 %)	8.40	3.40
TOT	.656	.518-.795	(21 %)	20093	16410-23777	(18 %)	636.54	257.61

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLC	.005	+-.012	(145 %)	219	+-525	(140 %)	6.948	142.2
BLG	.034	.023-.044	(32 %)	1108	839-1377	(24 %)	35.096	100.4
CCF	.038	.010-.065	(73 %)	723	552-895	(24 %)	22.916	469.4
LMB	.011	.002-.021	(83 %)	269	166-372	(38 %)	8.511	806.4
RBT	.027	.019-.035	(31 %)	771	443-1098	(42 %)	24.414	344.1
RSF	.013	.009-.017	(31 %)	386	298-475	(23 %)	12.238	139.0
WAE	.001	+-.002	(133 %)	34	12-57	(65 %)	1.089	610.1
WAM	.000		(0 %)			(0 %)	.006	80.2
WHC	.003	.000-.005	(83 %)	51	15-87	(70 %)	1.622	167.6
MSC	.000	.000-.001	(65 %)	25	7-43	(72 %)	.792	94.3
TOT	.132	.103-.160	(22 %)	3587	3015-4160	(16 %)	113.633	178.5

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLC	.011	+-.027	(145 %)	484	+-1158	(140 %)	6.199	.3135
BLG	.074	.050-.098	(32 %)	2442	1849-3036	(24 %)	31.313	.2214
CCF	.083	.022-.143	(73 %)	1595	1217-1973	(24 %)	20.446	1.0348
LMB	.025	.004-.045	(83 %)	592	365-820	(38 %)	7.594	1.7778
RBT	.060	.041-.078	(31 %)	1699	977-2421	(42 %)	21.782	.7587
RSF	.028	.020-.037	(31 %)	852	656-1047	(23 %)	10.919	.3065
WAE	.002	+-.005	(133 %)	76	26-125	(65 %)	.972	1.3451
WAM	.000		(0 %)			(0 %)	.005	.1768
WHC	.006	.001-.011	(83 %)	113	33-192	(70 %)	1.447	.3694
MSC	.002	.000-.003	(65 %)	55	15-95	(72 %)	.707	.2079
TOT	.290	.227-.353	(22 %)	7908	6646-9170	(16 %)	101.384	.3936

TABLE FINAL REPORT FOR RANDOLPH CO. 1995 DAY CREEL.
DAYTIME DATA FOR LAKE=RANDOLPH COUNTY LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	4.4	4.2 - 4.6	(5%)	.3	12.3	449
SHORE	1.9	1.6 - 2.1	(13%)	.3	6.6	109
BOAT & SHORE	3.9	3.7 - 4.1	(5%)	.3	12.3	558

304 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
37.3% OF ALL 1496 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	27.4	26 - 28.7	(5%)	1	300	1492
SUCCESS RATING 1-10?	4	3.9 - 4.2	(4%)	1	10	1484

IS CATCH ILLEGAL?
CLERK NOTED 7 OUT OF 1496 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	492	(32.9%)	SUN	2	(.1%)
CRP	10	(.7%)	RBT	158	(10.6%)
BSS	19	(1.3%)	WAE	11	(.7%)
LMB	219	(14.6%)	BLC	41	(2.7%)
CCF	209	(14%)	BLG	322	(21.5%)
RSF	10	(.7%)	WHC	2	(.1%)
SMB	1	(.1%)			

PARTY SIZE VS. # INTERVIEWS

BOAT		SHORE	
1	129	1	370
2	389	2	322
3	72	3	107
4	24	4	40
5	5	5	18
6		6	10
7	2	7	4
8		8	3
9		9	
10+		10+	1

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=5 LAKE :=RED HILLS LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :40 SAMPLING RATIO :=325/738 = 44%
NUMBER OF INTERVIEWS:798

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	3506	2956-4056	(16%)	88	74-101	(16%)	20.42
WKND/HOL	2938	2516-3360	(14%)	73	63-84	(14%)	39.59
STR TOTAL	6444	5763-7125	(11%)	161	144-178	(11%)	29.16
SHORE FISHING:							
WEEKDAY	2028	1581-2475	(22%)	51	40-62	(22%)	11.06
WKND/HOL	1324	1039-1609	(21%)	33	26-40	(21%)	18.58
STR TOTAL	3352	2838-3866	(15%)	84	71-97	(15%)	14.03
BOAT/SHORE COALESCED:							
WEEKDAY	5399	4581-6217	(15%)	135	115-155	(15%)	17.42
WKND/HOL	4230	3619-4841	(14%)	106	90-121	(14%)	33.31
STR TOTAL	9629	8629-10629	(10%)	241	216-266	(10%)	24.40
BOAT/SHORE STRATIFIED:							
WEEKDAY	5535	4832-6238	(13%)	138	121-156	(13%)	16.99
WKND/HOL	4264	3775-4753	(11%)	107	94-119	(11%)	33.04
STR TOTAL	9799	8952-10646	(9%)	245	224-266	(9%)	23.97

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=RED HILLS LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :40 SAMPLING RATIO :=650/1476 = 44%
RATIO OF EFFORT HOURS INTERVIEWED := 2349.2/9801.6 = 23.96%
NUMBER OF INTERVIEWS: 798

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GOS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLB	.000	+-.003	(257 %)	3	+-12	(257 %)	.21	.09
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.955	.807-1.103	(15 %)	14022	12081-15963	(14 %)	866.19	350.54
CCF	.038	.025-.052	(36 %)	614	398-829	(35 %)	37.91	15.34
LMB	.101	.070-.132	(31 %)	1887	1471-2303	(22 %)	116.58	47.18
RSF	.014	.004-.023	(71 %)	145	66-224	(54 %)	8.98	3.64
WAM	.002	+-.003	(104 %)	20	1-40	(94 %)	1.26	.51
WHC	.054	.026-.083	(53 %)	1150	105-2195	(91 %)	71.05	28.76
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000	+-.000	(150 %)	6	+-16	(150 %)	.38	.16
TOT	1.165	1.010-1.320	(13 %)	17848	15647-20049	(12 %)	1102.56	446.20

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLB	.000	+-.000	(257 %)		+-2	(257 %)	.036	170.6
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.093	.079-.107	(15 %)	1392	1201-1583	(14 %)	85.971	99.3
CCF	.016	.009-.024	(46 %)	240	140-340	(42 %)	14.842	391.5
LMB	.048	.019-.077	(60 %)	786	595-976	(24 %)	48.525	416.3
RSF	.004	.001-.007	(69 %)	44	21-68	(54 %)	2.745	305.7
WAM	.000	.000-.000	(98 %)	3	-5	(98 %)	.159	125.9
WHC	.015	.008-.021	(42 %)	308	74-542	(76 %)	19.020	267.7
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000	+-.000	(199 %)	1	+-3	(198 %)	.068	176.8
TOT	.176	.147-.205	(17 %)	2774	2422-3126	(13 %)	171.366	155.4

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLB	.000	+-.001	(257 %)	1	+-5	(257 %)	.032	.3828
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.205	.175-.236	(15 %)	3068	2647-3490	(14 %)	76.704	.2188
CCF	.035	.019-.052	(46 %)	530	310-750	(42 %)	13.242	.8631
LMB	.106	.043-.169	(60 %)	1732	1312-2152	(24 %)	43.294	.9177
RSF	.009	.003-.015	(69 %)	98	45-151	(54 %)	2.449	.6739
WAM	.000	.000-.000	(98 %)	6	-11	(98 %)	.142	.2777
WHC	.032	.018-.046	(42 %)	679	163-1194	(76 %)	16.969	.5902
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC	.000	+-.000	(199 %)	2	+-7	(198 %)	.061	.3898
TOT	.389	.324-.453	(17 %)	6116	5340-6892	(13 %)	152.893	.3427

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=5 LAKE :=RED HILLS LAKE
DISTRICT :=23 YEAR :=95
ACREAGE :40 SAMPLING RATIO :=650/1476 = 44%
RATIO OF EFFORT HOURS INTERVIEWED := 2349.2/9801.6 = 23.96%
NUMBER OF INTERVIEWS: 798

COMBINED ACROSS STRATA:

YEAR PERIOD 03/15 TO 04/08 OF SECTION 1
YEAR PERIOD 04/09 TO 04/30 OF SECTION 1
YEAR PERIOD 05/01 TO 05/31 OF SECTION 1
YEAR PERIOD 06/01 TO 06/15 OF SECTION 1
YEAR PERIOD 06/16 TO 08/31 OF SECTION 1
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 11/01 TO 11/15 OF SECTION 1

MSC SPECIES CAUGHT:
GOS
SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.828	.703-.953	(15 %)	12567	10790-14345	(14 %)	776.34	314.18
CCF	.033	.020-.046	(40 %)	514	306-722	(40 %)	31.77	12.86
LMB	.008	+-.019	(148 %)	84	-167	(99 %)	5.17	2.09
RSF	.014	.004-.023	(71 %)	145	66-224	(54 %)	8.98	3.64
WAM	.002	+-.003	(104 %)	20	1-40	(94 %)	1.26	.51
WHC	.051	.023-.079	(54 %)	1085	248-1921	(77 %)	67.00	27.12
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.935	.805-1.065	(14 %)	14416	12494-16338	(13 %)	890.53	360.39

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.087	.074-.100	(15 %)	1318	1132-1503	(14 %)	81.405	104.9
CCF	.016	.008-.023	(48 %)	230	130-329	(43 %)	14.184	446.4
LMB	.006	+-.014	(136 %)	67	9-125	(86 %)	4.139	800.4
RSF	.004	.001-.007	(69 %)	44	21-68	(54 %)	2.745	305.7
WAM	.000	.000-.000	(98 %)	3	-5	(98 %)	.159	125.9
WHC	.014	.008-.020	(43 %)	301	89-513	(70 %)	18.605	277.7
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.127	.109-.145	(14 %)	1963	1683-2242	(14 %)	121.238	136.1

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLB		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.192	.163-.221	(15 %)	2905	2496-3315	(14 %)	72.630	.2312
CCF	.034	.018-.051	(48 %)	506	286-726	(43 %)	12.655	.9842
LMB	.014	+-.032	(136 %)	148	21-275	(86 %)	3.693	1.7645
RSF	.009	.003-.015	(69 %)	98	45-151	(54 %)	2.449	.6709
WAM	.000	.000-.000	(98 %)	6	-11	(98 %)	.142	.2777
WHC	.031	.018-.044	(43 %)	664	196-1132	(70 %)	16.600	.6122
YEB		*** NOT RECORDED ***			*** NOT RECORDED ***			
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.280	.241-.320	(14 %)	4327	3711-4943	(14 %)	108.169	.3001

TABLE FINAL REPORT FOR RED HILLS 1995 DAY CREEL.
DAYTIME DATA FOR LAKE=RED HILLS LAKE CREEL BEGUN IN YEAR=95

SECTION 1 FROM 03/15 TO 04/08
SECTION 1 FROM 04/09 TO 04/30
SECTION 1 FROM 05/01 TO 05/31
SECTION 1 FROM 06/01 TO 06/15
SECTION 1 FROM 06/16 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 1 FROM 11/01 TO 11/15

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	3.2	3 - 3.4	(7%)	.5	9.5	194
SHORE	1.8	1.4 - 2.2	(22%)	.5	4.8	30
BOAT & SHORE	3	2.8 - 3.2	(7%)	.5	9.5	224

98 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
31.1% OF ALL 720 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	26	21.7 - 30.3	(17%)	0	900	716
SUCCESS RATING 1-10?	5.8	5.7 - 6	(2%)	1	10	713

IS CATCH ILLEGAL?
CLERK NOTED 5 OUT OF 720 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	275 (38.2%)	LMB	99 (13.8%)
BLG	306 (42.5%)	WHC	19 (2.6%)
CCF	21 (2.9%)		

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	170	1	83
2	283	2	123
3	42	3	17
4		4	1
5		5	1
6		6	
7		7	
8		8	
9		9	
10+		10+	

EFFORT TABLE FOR THE FULL DAY *** DAY ***

REGION :=2 LAKE :=SKOKIE LAGOONS
DISTRICT :=09 YEAR :=95
ACREAGE :229 SAMPLING RATIO :=272/1476 = 18.4%
NUMBER OF INTERVIEWS:709

YEAR PERIOD 07/01 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 07/01 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 07/01 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3
YEAR PERIOD 07/01 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4

	ANGL HRS	95% CONF INTVL		HRS/ ACRE	95% CONF INTVL		% EFF INTVD
BOAT FISHING:							
WEEKDAY	883	344-1422	(61%)	4	2-6	(61%)	2.75
WKND/HOL	2905	2045-3765	(30%)	13	9-16	(30%)	4.71
STR TOTAL	3788	2303-4773	(26%)	17	12-21	(26%)	4.25
SHORE FISHING:							
WEEKDAY	14364	11623-17105	(19%)	63	51-75	(19%)	4.17
WKND/HOL	20071	16111-24031	(20%)	88	70-105	(20%)	6.24
STR TOTAL	34435	29722-39148	(14%)	150	130-171	(14%)	5.38
BOAT/SHORE COALESCED:							
WEEKDAY	15210	12182-18238	(20%)	66	53-80	(20%)	4.10
WKND/HOL	22895	18442-27348	(19%)	100	81-119	(19%)	6.07
STR TOTAL	38105	32825-43385	(14%)	166	143-189	(14%)	5.28
BOAT/SHORE STRATIFIED:							
WEEKDAY	15247	12466-18029	(18%)	67	54-79	(18%)	4.09
WKND/HOL	22979	18944-27014	(18%)	100	83-118	(18%)	6.05
STR TOTAL	38226	33422-43030	(13%)	167	146-188	(13%)	5.27

CAUGHT AND CPUE TABLE *** DAY ***
REGION :=2 LAKE :=SKOKIE LAGOONS
DISTRICT :=09 YEAR :=95
ACREAGE :229 SAMPLING RATIO :=544/2952 = 18.4%
RATIO OF EFFORT HOURS INTERVIEWED := 2012.8/38227.9 = 5.26%
NUMBER OF INTERVIEWS: 709

COMBINED ACROSS STRATA:

YEAR PERIOD 07/01 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 07/01 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 07/01 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3
YEAR PERIOD 07/01 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: CAUGHT

SPEC	#/HR	95% CI		# CAUGHT	95% CI		#/HA	#/ACRE
BLB	.035	.017-.052	(51 %)	1602	954-2249	(40 %)	17.28	7.00
BLC	.000	+-.000	(236 %)	39	+-132	(237 %)	.42	.17
BLG	.621	.512-.731	(18 %)	42782	33304-52260	(22 %)	461.63	186.82
CAP	.010	+-.028	(183 %)	529	+-1496	(183 %)	5.71	2.31
CCF	.010	.000-.019	(90 %)	946	+-1984	(110 %)	10.21	4.13
GSF	.000	+-.000	(318 %)	16	+-65	(318 %)	.17	.07
LMB	.370	.303-.436	(18 %)	33136	19954-46317	(40 %)	357.54	144.70
NOP	.000	+-.000	(237 %)	12	+-39	(237 %)	.13	.05
YEB	.008	+-.020	(165 %)	1151	+-3601	(213 %)	12.42	5.03
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	1.054	.919-1.189	(13 %)	80212	64761-95662	(19 %)	865.50	350.27

SPEC	KG/HR	95% CI		KG CAUGHT	95% CI		KG/HA	AVG WT(G)
BLB	.002	.000-.003	(46 %)	97	51-144	(48 %)	1.052	60.8
BLC	.000	+-.000	(237 %)		+-2	(236 %)	.007	15.4
BLG	.018	.015-.021	(17 %)	1334	1019-1649	(24 %)	14.394	31.2
CAP	.002	+-.006	(197 %)	112	+-326	(193 %)	1.203	210.8
CCF	.002	+-.006	(158 %)	270	+-735	(172 %)	2.912	285.3
GSF	.000	+-.000	(318 %)		+-2	(318 %)	.005	28.3
LMB	.021	.011-.030	(46 %)	1581	817-2946	(57 %)	20.301	56.8
NOP	.000	+-.000	(236 %)	14	+-48	(236 %)	.154	1222.0
YEB	.000	+-.001	(143 %)	68	+-170	(151 %)	.730	58.8
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.046	.036-.055	(21 %)	3777	2545-5010	(33 %)	40.756	47.1

SPEC	LB/HR	95% CI		LB CAUGHT	95% CI		LB/ACRE	AVG WT(LB)
BLB	.004	.002-.006	(46 %)	215	111-318	(48 %)	.938	.1341
BLC	.000	+-.000	(237 %)	1	+-4	(236 %)	.006	.0340
BLG	.041	.034-.047	(17 %)	2941	2247-3634	(24 %)	12.842	.0687
CAP	.005	+-.013	(197 %)	246	+-719	(193 %)	1.074	.4648
CCF	.005	+-.012	(158 %)	595	+-1620	(172 %)	2.598	.6289
GSF	.000	+-.000	(318 %)		+-4	(318 %)	.004	.0623
LMB	.046	.025-.066	(46 %)	4148	1800-6495	(57 %)	18.113	.1252
NOP	.000	+-.000	(236 %)	31	+-106	(236 %)	.137	2.6939
YEB	.000	+-.002	(143 %)	149	+-374	(151 %)	.651	.1295
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.100	.079-.122	(21 %)	8327	5610-11044	(33 %)	36.363	.1038

HARVESTED AND CPUE TABLE *** DAY ***
REGION :=2 LAKE :=SKOKIE LAGOONS
DISTRICT :=09 YEAR :=95
ACREAGE :229 SAMPLING RATIO :=544/2952 = 18.4%
RATIO OF EFFORT HOURS INTERVIEWED := 2012.8/38227.9 = 5.26%
NUMBER OF INTERVIEWS: 709

COMBINED ACROSS STRATA:

YEAR PERIOD 07/01 TO 08/31 OF SECTION 1 COALESCED WITH
YEAR PERIOD 09/01 TO 09/30 OF SECTION 1
YEAR PERIOD 10/01 TO 10/31 OF SECTION 1
YEAR PERIOD 07/01 TO 08/31 OF SECTION 2
YEAR PERIOD 09/01 TO 09/30 OF SECTION 2
YEAR PERIOD 10/01 TO 10/31 OF SECTION 2
YEAR PERIOD 07/01 TO 08/31 OF SECTION 3
YEAR PERIOD 09/01 TO 09/30 OF SECTION 3
YEAR PERIOD 10/01 TO 10/31 OF SECTION 3
YEAR PERIOD 07/01 TO 08/31 OF SECTION 4
YEAR PERIOD 09/01 TO 09/30 OF SECTION 4
YEAR PERIOD 10/01 TO 10/31 OF SECTION 4

MSC SPECIES CAUGHT:

SUBSTRATUM:
DAY PERIODS STRATIFIED
WEEKDAY/WEEKEND: WEEKDAY/WEEKEND STRATIFIED
FISHING TYPE: BOAT/SHORE STRATIFIED
FISH: HARVESTED

SPEC	#/HR	95% CI		# HARVST	95% CI		#/HA	#/ACRE
BLB	.004	+-.010	(148 %)	301	23-580	(92 %)	3.25	1.32
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.214	.146-.282	(32 %)	17745	12236-23253	(31 %)	191.47	77.49
CAP	.008	+-.026	(218 %)	452	+-1397	(209 %)	4.88	1.98
CCF	.005	+-.027	(476 %)	728	+-1776	(144 %)	7.85	3.18
GSF	.000	+-.000	(318 %)	16	+-65	(318 %)	.17	.07
LMB	.033	.017-.049	(48 %)	2423	1326-3521	(45 %)	26.15	10.58
NOP	.000	+-.000	(237 %)	12	+-39	(237 %)	.13	.05
YEB	.001	+-.007	(418 %)	73	+-274	(278 %)	.78	.32
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.265	.192-.339	(28 %)	21749	15644-27854	(28 %)	234.69	94.98

SPEC	KG/HR	95% CI		KG HARVST	95% CI		KG/HA	AVG WT(G)
BLB	.000	+-.000	(124 %)	31	5-58	(84 %)	.339	104.2
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.008	.006-.011	(29 %)	753	495-1012	(34 %)	8.128	42.5
CAP	.002	+-.006	(215 %)	105	+-316	(202 %)	1.130	231.6
CCF	.001	+-.008	(467 %)	247	+-713	(189 %)	2.664	339.1
GSF	.000	+-.000	(318 %)		+-2	(318 %)	.005	28.3
LMB	.002	.000-.003	(56 %)	232	+-526	(127 %)	2.502	95.7
NOP	.000	+-.000	(236 %)	14	+-48	(236 %)	.154	1222.0
YEB	.000	+-.000	(374 %)	19	+-56	(199 %)	.202	257.9
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.014	.009-.020	(36 %)	1401	589-2214	(58 %)	15.122	64.4

SPEC	LB/HR	95% CI		LB HARVST	95% CI		LB/ACRE	AVG WT(LB)
BLB	.000	+-.002	(124 %)	69	11-128	(84 %)	.303	.2298
BLC		*** NOT RECORDED ***			*** NOT RECORDED ***			
BLG	.019	.013-.024	(29 %)	1661	1091-2231	(34 %)	7.252	.0936
CAP	.004	+-.013	(215 %)	231	+-697	(202 %)	1.008	.5106
CCF	.003	+-.018	(467 %)	544	+-1571	(189 %)	2.376	.7476
GSF	.000	+-.000	(318 %)		+-4	(318 %)	.004	.0623
LMB	.004	.002-.007	(56 %)	511	+-1159	(127 %)	2.232	.2109
NOP	.000	+-.000	(236 %)	31	+-106	(236 %)	.137	2.6939
YEB	.000	+-.002	(374 %)	41	+-123	(199 %)	.180	.5685
MSC		*** NOT RECORDED ***			*** NOT RECORDED ***			
TOT	.032	.020-.043	(36 %)	3090	1298-4882	(58 %)	13.492	.1421

TABLE FINAL REPORT FOR SKOKIE LAGOONS 1995 DAY CREEL.
DAYTIME DATA FOR LAKE=SKOKIE LAGOONS CREEL BEGUN IN YEAR=95

SECTION 1 FROM 07/01 TO 08/31
SECTION 1 FROM 09/01 TO 09/30
SECTION 1 FROM 10/01 TO 10/31
SECTION 2 FROM 07/01 TO 08/31
SECTION 2 FROM 09/01 TO 09/30
SECTION 2 FROM 10/01 TO 10/31
SECTION 3 FROM 07/01 TO 08/31
SECTION 3 FROM 09/01 TO 09/30
SECTION 3 FROM 10/01 TO 10/31
SECTION 4 FROM 07/01 TO 08/31
SECTION 4 FROM 09/01 TO 09/30
SECTION 4 FROM 10/01 TO 10/31

HOURS PER COMPLETED TRIP:

	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
BOAT	2.6	1.6 - 3.6	(37%)	1	5.5	12
SHORE	2.1	1.6 - 2.5	(23%)	.5	6	28
BOAT & SHORE	2.2	1.8 - 2.7	(19%)	.5	6	40

7 SAMPLES WERE FROM SPLIT INTERVIEWS OF COMPLETED TRIPS
5.6% OF ALL 710 INTERVIEWS WERE COMPLETED TRIPS

SUPPLEMENTARY DATA:

QUESTION	MEAN	95% CONF.INTVL. OF MEAN		MIN.	MAX.	#SAMPLES
DISTANCE TRAVELLED IN MILES	14.6	13.9 - 15.3	(5%)	1	55	700
SUCCESS RATING 1-10?	4	3.8 - 4.2	(5%)	1	10	593

IS CATCH ILLEGAL?
CLERK NOTED 45 OUT OF 710 INTERVIEWS HAD ILLEGAL CATCHES

INTERVIEWS (AND %) PER SPECIES SOUGHT

ANY	510	(71.8%)	BSS	29	(4.1%)
CAT	15	(2.1%)	BLG	57	(8%)
LMB	79	(11.1%)	CAP	5	(.7%)
CCF	12	(1.7%)	CRP	2	(.3%)
SMB	1	(.1%)			

PARTY SIZE VS. # INTERVIEWS

	BOAT		SHORE
1	15	1	298
2	30	2	264
3	7	3	65
4		4	19
5		5	6
6		6	5
7		7	1
8		8	
9		9	
10+		10+	

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